Vol. 929 Number 4

OFFICIAL GAZETTE

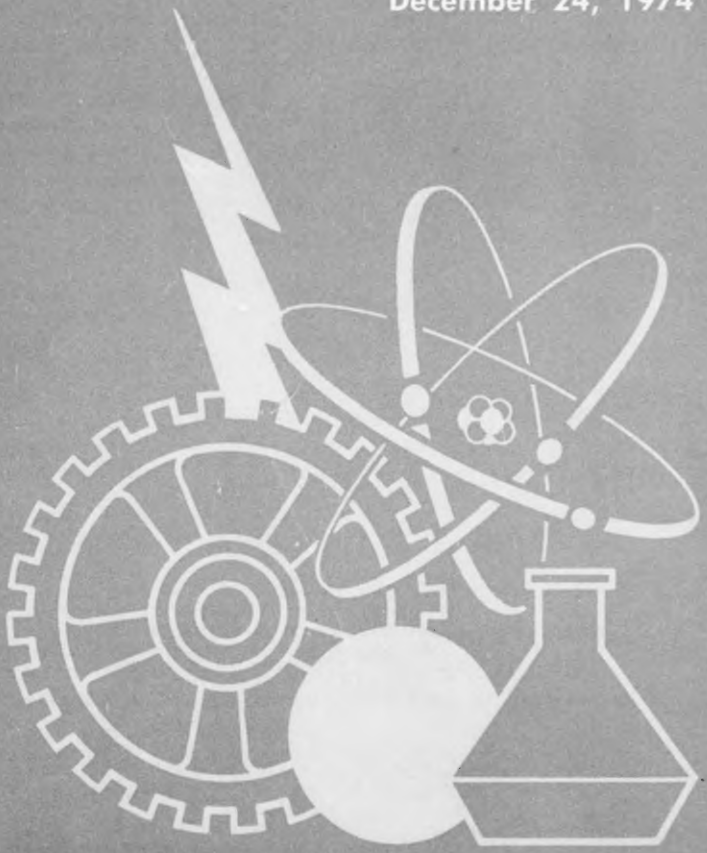
of the

UNITED STATES PATENT OFFICE

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

December 24, 1974



U. S. DEPARTMENT OF COMMERCE

Patent Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

December 24, 1974 Volume 929 Number 4

CONTENTS

	Page
Patent and Trademark Notices	
Publication of Applications Under Trial Voluntary Protest Program	1356
Patent Suits	1356
Patent Notices	
Certificates of Correction for the Week of December 24, 1974	1358
Adverse Decisions in Interferences	1358
Dedications	1358
Disclaimers	1358
Condition of Patent Applications	1359
Reissue Patents Granted (28,279)	1361
Plant Patents Granted (3,670)	1364
Patents Granted	
General and Mechanical (3,855,631)	1365
Chemical (3,856,464)	1644
Electrical (3,856,978)	1772
Design Patents Granted (233,959)	1819
Index of Patentees	PI 1
Indices of Applicants of Reissues, Plants and Designs	PI 45
Classification of	
Patents (Including Reissues)	PI 47
Designs and Plants	PI 50
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 51
Designs and Plants	PI 53

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $211.00 per annum, foreign mailing $52.75 additional; single copies $4.10 each.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $60.25 per annum, foreign mailing $15.10 additional; single copies $1.25 each.

CIRCULARS OF GENERAL INFORMATION concerning PATENTS, price 60 cents each.

CIRCULARS OF GENERAL INFORMATION concerning TRADEMARKS, price 50 cents each.

PRINTED COPIES OF PATENTS are furnished by the Patent Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS and DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.O.

PATENT OFFICE NOTICES

Publication of Applications Under Trial Voluntary Protest Program

The January 28, 1975 issue of the Official Gazette will include publication of information identifying the 665 applications in which secrecy was waived under the Trial Voluntary Protest Program announced by the Notice of May 7, 1974, published at 923 O.G. 2 on June 4, 1974. The identifying information will include matter similar to that used in the Official Gazette for patents and will also list the references cited by the Patent Office and the number of the examining group in which the application was examined.

From January 28, 1975 to April 28, 1975 the application files of the applications listed in the Official Gazette will be made available for public inspection upon written request in the examining group identified.

Applications in which secrecy has been waived under the Trial Voluntary Protest Program will be published in printed form, similar to that of printed patents. Printed copies will be available on and after January 28, 1975 at the prices set by statute for patent copies. Orders for copies of the published applications must include the "B" prefix before the Serial Number to differentiate them from orders for patents.

Orders for copies of the January 28, 1975 Official Gazette may be placed with the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. The price is $6.60 per copy.

Any protests relating to the patentability of these published applications must be filed in writing in the Patent Office no later than April 28, 1975.

C. MARSHALL DANN,
Dec. 2, 1974 *Commissioner of Patents.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,658,472, E. M. Ransburg, ELECTROSTATIC COATING AND APPARATUS; **2,685,536,** Ransburg and Starkey, METHOD FOR ELECTROSTATICALLY COATING ARTICLES; **2,794,417,** same, APPARATUS FOR ELECTROSTATICALLY COATING ARTICLES; **2,808,343,** C. C. Simmons, METHOD AND APPARATUS FOR SPRAY COATING OF ARTICLES; **2,893,893,** W. W. Crouse, METHOD AND APPARATUS FOR ELECTROSTATIC COATING; **2,893,894,** E. M. Ransburg, METHOD AND APPARATUS FOR ELECTROSTATICALLY COATING; **Re. 24,602,** C. C. Simmons, ELECTROSTATIC METHOD AND APPARATUS FOR SPRAY COATING OF ARTICLES, **filed** Nov. 21, 1957, D.C. Md. (Baltimore), Doc. 10181–C, *Ransburg Electro-Coating Corp.* v. *Proctor Electric Co., Inc. and Ionic Electro-Static Corp.* Final judgment—plaintiff is owner of 2,685,536, 2794,417, 2,893,893, 2,893,894, and Re. 24,602, claims 1–11 of the '536 patent, claims 3 and 4 of the '417 patent, claims 1–3, 5, 6, and 8–10 of the '893 patent, claims 1–8 of the '894 patent and claims 1, 6–10, 12, 13 and 15–21 of the '602 patent are valid and have been infringed by defendant. Defendant is hereby permanently enjoined from further acts of infringement. Plaintiff's claim is hereby dismissed with prejudice. All other claims in this action are hereby dismissed with prejudice, May 7, 1974.

2,685,536. (See 2,658,472.)

2,794,417. (See 2,658,472.)

2,808,343. (See 2,658,472.)

2,893,893. (See 2,658,472.)

2,893,894. (See 2,658,472.)

3,051,939, R. W. Gilbert, ANALOG-TO-DIGITAL CONVERTER; **3,316,547,** S. K. Ammann, INTEGRATING ANALOG-TO-DIGITAL CONVERTER; **3,713,136,** J. Nagy, Jr., same, **filed** May 23, 1974, D.C., N.D. Calif. (San Francisco), Doc. C–74–1099 CBR, *Weston Instruments Inc.* v. *Systron-Donner Corp.*

3,163,299, J. C. Settles, IMPACT ENERGY ABSORBING MECHANISM FOR RAILWAY VEHICLES, **filed** Nov. 28, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c3009, *Buckeye Steel Casting Co.* v. *Evans Products Company et al.* By agreement order cause dismissed with prejudice, Mar. 18, 1974.

3,197,093, V. H. Doran, DISPLAY HEAD, **filed** July 9, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV–74–1929–R, *Plasti-Personalities, Inc.* v. *Spako Plastic Products.*

3,257,668, S. A. Braley, SILICONE RUBBER PROSTHETIC EAR FRAME; **3,293,663,** T. D. Cronin, SURGICALLY IMPLANTABLE HUMAN BREAST PROSTHESIS, **filed** Feb. 19, 1971, D.C., E.D. Wis. (Milwaukee), Doc. 71–C–75, *Dow Corning Corporation* v. *Surgitek, Inc. and Medical Engineering Corp.* Patent No. 3,293,663 found valid and infringed. Injunction issued, July 5, 1974.

3,293,663. (See 3,257,668.)

3,316,547. (See 3,051,939.)

3,319,872, Beckman and Beerbohm, MAILER, **filed** June 28, 1974, D.C.N.J. (Newark), Doc. 74–983, *Jonergin, Inc.* v. *2B System Corporation.*

3,325,277, R. A. Huseby, METHOD OF MAKING METAL POWDER; **3,528,081,** Huseby and Garner, METHOD OF MAKING STEEL POWDER; **3,668,024,** M. Johnson, METHOD OF ANNEALING METAL POWDER; **3,687,654,** R. A. Huseby, METHOD OF MAKING ALLOY STEEL POWDER, **filed** July 10, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c1919, *A. O. Smith-Inland Corporation* v. *Hoeganaes Corporation.*

3,371,950, J. Stap, TENNIS BALL RETRIEVER AND STORAGE UNIT, **filed** July 9, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV–74–1909–F, *Jacob Stap* v. *Sandra Trepper.*

3,393,372, Vickery and Fisher, CARBON DIOXIDE LASER SYSTEMS FOR THE EMISSION OF COHERENT RADIATION, **filed** Dec. 1, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c3050, *Semi-Elements Inc. et al.* v. *Motorola, Inc.* Case transferred to Phoenix, Ariz., Apr. 30, 1973.

3,399,501, W. E. Rossman, AUDITORIUM INSTALLATIONS, **filed** May 16, 1974, D.C. Nebr. (Omaha), Doc. CV 74–O–134, *The Macton Corporation* v. *The Board of Regents of the University of Nebraska.*

3,490,356, Peterson and Hogan, SPRAY DISCHARGE HEAD, **filed** July 9, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c1916, *Reynolds Products, Inc.* v. *Cory Corporation.*

3,528,081. (See 3,325,277.)

3,535,927, Mahon and McMurtrie, COMPENSATED THERMISTOR SENSOR, **filed** Dec. 29, 1970, D.C.N.J. (Newark), Doc. 1746–70, *Fischer & Porter Company* v. *Eastech, Inc., Douglas F. White, Tlan E. Rodely and Charles L. McMurtrie.* Stipulation and order of dismissal, Dec. 31, 1970.

3,668,024. (See 3,325,277.)

3,687,654. (See 3,325,277.)

3,713,136. (See 3,051,939.)

3,731,825, Holland and Fox, SELF-UNLOADING PARTICULATE MATERIAL DELIVERY SYSTEM; **3,788,504,** J. H. Holland, MATERIAL DELIVERY SYSTEM; **3,791,511,** same, CONVEYOR SYSTEM; **3,794,194,** same, SELF-UNLOADING MATERIAL DELIVERY SYSTEM; **D. 220,174,** same, SEMI-TRAILER, **filed** Mar. 25, 1974, D.C. Puerto Rico (San Juan), Doc. C–74–331, *J. H. Holland Company* v. *Terra Products Corporation.*

3,771,024, C. J. Dumas, MULTIPLIER ASSEMBLY WITH AIR AND MATERIAL DIELECTRIC BARRIERS, **filed** Feb. 25, 1974, D.C., N.D. Tex. (Dallas), Doc. CA3–74–169–D, *American Plasticraft Company* v. *Varo, Inc. and Varo Semiconductor, Inc.*

3,776,698, A. M. Eisentraut, TEST FOR THYROID HORMONE, **filed** Feb. 20, 1974, D.C., N.D. Calif. (San Francisco), Doc. C–74–401 SW, *Nuclear-Medical Laboratories, Inc.* v. *Bio Rad Laboratories.*

3,776,756, Barouh and Glenn, CORRECTION MATERIAL AND METHOD FOR THE MANUFACTURE, **filed** Mar. 20, 1974, D.C., S.D.N.Y., Doc. 74–C–1292, *Victor Barouh and Robert Glenn* v. *Emanuel Fontana and Paco Impressions Corp.*

3,788,504. (See 3,731,825.)

3,791,511. (See 3,731,825.)

3,792,328, R. M. Stockman, CAPACITOR, **filed** May 7, 1974, D.C. Conn. (Bridgeport), Doc. B–74–168, *American Radionic Co., Inc.* v. *Electro Motive Manufacturing Co., Inc.*

3,794,194. (See 3,731,825.)

3,807,229, W. E. Chiles, BYPASS FLOWMETER, **filed** Jan. 11,1974, D.C., N.D. Ill. (Chicago), Doc. 74c103, *Max Von Radics et al.* v. *Trippe Manufacturing Company.*

3,813,537, G. Lieberman, LAMPSHADE AND LAMP COMBINATION AND MEANS FOR JOINING ONE WITH THE OTHER, **filed** May 23, 1974, D.C.N.J. (Trenton), Doc. C–74–758, *Stylette Plastics, Inc.* v. *Softlite, Inc.* **Same, filed** June 25,1974, D.C. Md. (Baltimore), Doc. N–74–657, *Softlite, Inc.* v. *Southeast Zayre, Inc.*

Re. 24,602. (See 2,658,472.)

Re. 27,111, R. E. Wilson, PITCH-BONDED REFRACTORY COMPOSITION, **filed** Feb. 15, 1974, D.C., W.D. Pa. (Pittsburgh), Doc. 74–157, *Basic Incorporated* v. *H. K. Porter Company, Inc.* Order dismissing complaint and counterclaim without prejudice, July 16, 1974.

D. 206,286, J. J. Ostyn, FLUORESCENT LIGHTING FIXTURE OR SIMILAR ARTICLE, **filed** July 1, 1974, D.C.N.J. (Newark), Doc. 74–986, *American Lighting Corp.* v. *Bernard McRonald, individually and trading as National Illuminating Company.*

D. 220,174. (See 3,731,825.)

D. 227,352, Meng and Briessen, PACKAGE WITH STAGGERED PRODUCT SLICES, **filed** Jan. 7, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c47, *L. D. Schreiber Cheese Co., Inc.* v. *Kraftco Corporation.*

Certificates of Correction for the Week of Dec. 24, 1974

Des. 232,888	3,803,095	3,831,064	3,839,557
3,560,473	3,803,463	3,831,148	3,840,385
3,610,527	3,806,080	3,831,207	3,840,439
3,625,873	3,807,379	3,831,855	3,840,520
3,632,192	3,809,615	3,833,244	3,840,546
3,706,566	3,810,405	3,833,268	3,840,632
3,707,266	3,810,851	3,833,535	3,840,939
3,711,460	3,813,432	3,833,685	3,841,952
3,714,585	3,815,647	3,833,863	3,842,093
3,729,817	3,816,784	3,833,906	3,842,147
3,733,402	3,817,159	3,833,946	3,842,534
3,740,834	3,817,515	3,834,003	3,842,628
3,742,171	3,817,726	3,834,011	3,842,646
3,744,096	3,818,218	3,834,216	3,842,663
3,750,089	3,819,805	3,834,297	3,842,687
3,753,870	3,820,075	3,834,418	3,842,702
3,757,040	3,821,082	3,834,568	3,842,726
3,759,992	3,821,189	3,834,866	3,842,955
3,771,132	3,821,318	3,834,871	3,842,978
3,771,864	3,821,426	3,834,935	3,843,225
3,773,095	3,823,256	3,835,205	3,843,325
3,773,765	3,823,321	3,836,213	3,843,361
3,775,652	3,823,332	3,836,590	3,843,394
3,775,671	3,824,370	3,836,690	3,843,497
3,776,811	3,824,435	3,836,696	3,843,530
3,778,691	3,825,118	3,836,793	3,843,678
3,779,937	3,825,595	3,836,797	3,843,862
3,780,488	3,825,600	3,836,833	3,843,900
3,784,516	3,826,318	3,837,118	3,843,917
3,784,864	3,827,046	3,837,289	3,844,116
3,786,998	3,827,228	3,837,576	3,844,611
3,788,891	3,827,674	3,837,577	3,844,678
3,792,382	3,828,021	3,837,769	3,844,723
3,793,166	3,828,748	3,837,960	3,844,918
3,797,225	3,828,845	3,837,963	3,845,205
3,798,046	3,828,919	3,837,995	3,845,281
3,799,655	3,829,565	3,838,400	3,845,549
3,799,904	3,830,697	3,839,110	3,845,970
3,801,532	3,830,858	3,839,123	

Adverse Decisions in Interferences

In the designated interference involving the indicated claims of the following patents final decision have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,225,017, I. P. Seegman, L. Morris and P. A. Mallard, MODIFIED POLYSULFIDE COMPOSITION, Interference No. 95,894, decided July 17, 1974, claims 1, 2 and 3.

Patent No. 3,547,774, R. W. J. Rebhahn and D. W. Bannister, PROCESS FOR FORMING A SOLUBILIZED STILBENE DYE AND A PROCESS FOR FORMING COLORED PAPER THEREWITH, Interference No. 98,132, decided Aug. 15, 1974, claims 1, 2 and 3.

Patent No. 3,554,984, N. J. George, POLYAMIDE-IMIDE RESINS, Interference No. 98,578, decided Aug. 6, 1974, claims 1 and 6.

Patent No. 3,562,810, B. T. Davis, PROTECTIVE MATERIAL AND GARMENTS FORMED THEREFROM, Interference No. 98,239, decided Aug. 26, 1974, claims 1, 2, 6 and 9.

Patent No. 3,600,705, W. Tantraporm, S. P. Yu and P. J. Shaver, HIGHLY EFFICIENT SUBCRITICALLY DOPED ELECTRON-TRANSFER EFFECT DEVICES, Interference No. 98,033, decided June 11, 1974, claims 1, 2, 6, 12 and 15.

Patent No. 3,610,635, M. Schiff and J. Rosen, CARD ADAPTER ATTACHMENT FOR CASSETTE TAPE RECORDER, Interference No. 98,010, decided July 18, 1974, claims 1–4, 8, 10, 12, 13, 20, 21, 23 and 30.

Patent No. 3,614,442, R. S. Brodsky, POCKET ALARM DOSIMETER, Interference No. 98,156, decided July 25, 1974, claims 1–6.

Patent No. 3,670,507, G. E. Mott and J. J. Zlober, MARINE DRILLING STRUCTURE WITH CURVED DRILL CONDUCTOR, Interference No. 98,366, decided Aug. 22, 1974, claims 1 and 2.

Patent No. 3,700,011, G. Walter, TERMINAL STRAIGHTENING METHOD AND MACHINE, Interference No. 98,288, decided Aug. 23, 1974, claims 1, 2 and 3.

Patent No. 3,765,414, M. Arlen, DRUG RELEASE SYSTEM, Interference No. 98,706, decided Aug. 28, 1974, claims 1–6, 10–14, 17, 20–25 and 30–34.

Dedications

2,901,409.—*Herbert K. De Long*, Midland, Mich. ANODIZING MAGNESIUM. Patent dated Aug. 25, 1959. Dedication filed Aug. 9, 1974, by the assignee, *The Dow Chemical Company*.

Hereby dedicates to the Public the remaining term of said patent.

3,035,918.—*Harold A. Sorgenti, Herman Nack*, Columbus, and *George F. Sachsel*, Worthington, Ohio. PROCESS FOR TREATING FOOD. Patent dated May 22, 1962. Dedication filed Aug. 2, 1974, by the assignee, *The Battelle Development Corporation*.

Hereby dedicates to the People of the United States the entire remaining term of said patent.

3,140,183.—*Herman Nack*, Columbus, Ohio. FLUIDIZED BED COOKING PROCESS. Patent dated July 7, 1964. Dedication filed Aug. 2, 1974, by the assignee, *The Battelle Development Corporation*.

Hereby dedicates to the People of the United States the entire remaining term of said patent.

3,181,945.—*Arthur R. Elsea*, Columbus, Ohio. HIGH STRENGTH STEEL. Patent dated May 4, 1965. Dedication filed Aug. 2, 1974, by the assignee, *The Battelle Development Corporation*.

Hereby dedicates to the People of the United States the entire remaining term of said patent.

Disclaimers

3,668,580.—*Robert Lloyd Barbin*, Lancaster, Pa. TOROIDAL DEFLECTION YOKE HAVING ASYMMETRICAL WINDINGS. Patent dated June 6, 1972. Disclaimer filed Oct. 16, 1972, by the assignee, *RCA Corporation*.

Hereby enters this disclaimer to claims 1 and 3 of said patent.

3,669,983.—*Leo Ralph Swett* and *James Daniel Ratajczyk*, Waukegan, Ill. PYRAZOLOTHIAZEPINES AND ISOXAZOLOTHIAZEPINES. Patent dated June 13, 1972. Disclaimer filed May 2, 1974, by the assignee, *Abbott Laboratories*.

Hereby enters this disclaimer to claims 1–11 inclusive of said patent.

3,679,942.—*Francis Patrick Daly*, Warwick, R.I. METAL-OXIDE-METAL, THIN-FILM CAPACITORS AND METHOD OF MAKING SAME. Patent dated July 25, 1972. Disclaimer filed Oct. 30, 1972, by the assignee, *RCA Corporation*.

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

3,763,250.—*Charanjit Rai*, Somerset, *Alphonso W. Marcellis*, Lake Interval, N.J., and *Donald E. Pearson*, Nashville, Tenn. HALOGENATION PROCESS. Patent dated Oct. 2, 1973. Disclaimer filed Aug. 8, 1974, by the assignee, *Cities Service Oil Company*.

Hereby enters this disclaimer to all claims of said patent.

PATENT EXAMINING CORPS

WILLIAM FELDMAN, Acting Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 25, 1974

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions: Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	11-29-73
GENERAL ORGANIC CHEMISTRY, GROUP 120—R. F. BURNETT, Acting Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-18-73
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	12-26-73
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. L. LEAVITT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-11-74
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-3-74
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	4-26-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	4-19-73
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-3-73
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	3-11-74
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-20-73
DESIGNS, GROUP 290—C D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	6-4-73
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	12-14-73
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines. Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools: Cutlery; Jacks.	2-11-74
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. PULFREY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-14-73
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	3-15-74
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	3-22-74

Expiration of patents: The patents within the range of numbers indicated below expire during November 1974, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,811,722 to 2,814,801, inclusive
Plant Patents..... Numbers 1,656 to 1,660, inclusive

REISSUE PATENTS

GRANTED DECEMBER 24, 1974

ERRATA

For CLASS	See PATENT NO.
187–029	28,282

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

28,279

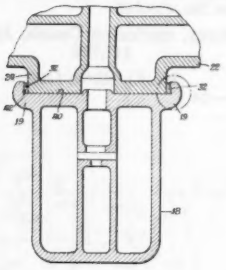
CENTER PLATE WEAR LINER RING

Hugh G. Robertson, Alliance, Ohio, by AMSTED Industries Inc., Chicago, Ill., assignee

Original No. 3,599,574, dated Aug. 17, 1971, Ser. No. 811,984, Apr. 1, 1969. Application for reissue May 29, 1973, Ser. No. 364,490

Int. Cl. B61f *5/14, 5/16;* F16c *17/04*

U.S. Cl. 105—199 C 2 Claims



1. In a railway vehicle including a car body supported upon a car truck by means of mating center plates on respective bolsters thereof, the center plate of said truck including a circular recess therein having an interior annular wall, and the center plate on the bolster of said body being circular and carried within said recess, the improvement comprising a circular wear ring disposed within said recess and surrounding said body center plate to prevent wear on said interior annular wall, said interior wall being inclined outward from top to bottom, said ring having a gap therein and having an outer surface tapered outward from top to bottom complementary with said interior wall, said ring being expanded at said gap to abut said interior annular wall about its circumference and being welded in expanded position to said annular wall in said gap.

28,280

HANDLE LATCH AND LABEL HOLDER

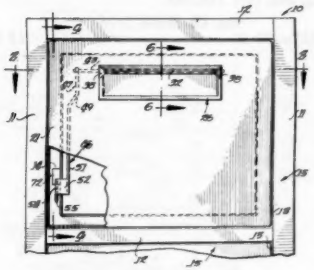
Vytant P. Aleks, Rockford, Ill., assignor to Keystone Consolidated Industries, Inc., Rockford, Ill.

Original No. 3,549,228, dated Dec. 22, 1970, Ser. No. 748,083, July 26, 1968. Application for reissue Dec. 7, 1972, Ser. No. 313,092

Int. Cl. A47b *88/00*

U.S. Cl. 312—320 4 Claims

4. A handle and label holder for a file cabinet drawer having a drawer front including a front panel having an opening therein and a back panel having an opening therein, said front and back panels defining a hollow space therebetween, comprising a hollow handle including an open front defined by a top wall, a bottom wall and integral opposite end walls forming an enclosure received in the opening in the front panel and extending rearwardly to the back panel, and an upwardly extending front lip formed at the front edge of the botom wall, and a label holder including a base conformably received on said handle bottom wall and abutting the upwardly extending lip, and a pair of generally parallel upwardly



and rearwardly inclined spaced walls integral with and intersecting the font edge of the base and adapted to receive a label therebetween, said label holder being formed of a generally transparent material, such as a transparent plastic.

28,281

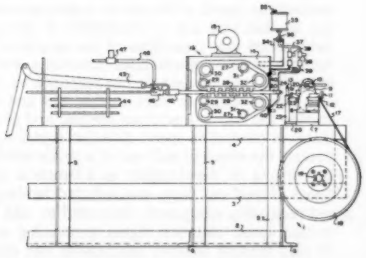
METHOD OF COATING THE INTERIOR OF A SAUSAGE CASING

Douglas J. Bridgeford, Champaign, Ill., assignor to Tee-Pak, Inc., Chicago, Ill.

Original No. 3,451,827, dated June 24, 1969, Ser. No. 509,117, Nov. 22, 1965. Application for reissue June 21, 1971, Ser. No. 155,368

Int. Cl. A22c *13/00*

U.S. Cl. 117—96 10 Claims



1. A method of coating the interior of a sausage casing of indefinite length which comprises shirring the casing on a mandrel having a longitudinal passage while introducing a coating composition comprising a solution, emulsion, or dispersion of an adherent coating material

in a liquid carrier through said passage to coat the interior of the casing.

28,282

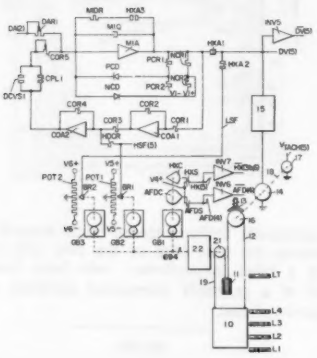
SPEED DICTATION APPARATUS FOR ELEVATOR MOTOR CONTROL SYSTEM

Sidney Howard Benjamin, Brooklyn, and Otto Albert Krauer, Tuckahoe, N.Y., assignors to Otis Elevator Company, New York, N.Y.

Original No. 3,552,524, dated Jan. 5, 1971, Ser. No. 795,842, Feb. 3, 1969. Application for reissue Dec. 18, 1972, Ser. No. 316,325

Int. Cl. B66b *1/28*

U.S. Cl. 187—29 R **13 Claims**



1. In a system for controlling the speed of travel of a high speed elevator car in which the car starts on any trip by accelerating in response to a signal to start and completes each trip by decelerating to a stop at a selected one of a plurality of landings in response to a signal to stop thereat, apparatus comprising,

time controlled speed dictation signal generating means operating in response to the reception of each signal to start and on each individual trip generating a time controlled speed dictation signal which is operable to control the speed of the car in a predetermined manner so that said car is accelerated at the same predetermined rate regardless of the length of the trip;

a landing selector mechanism operating during each individual trip of said car in response to the reception of the signal to start on that trip and the signal to stop the trip at a selected landing and generating a distance controlled speed dictation signal operable to control the speed of said car in a predetermined manner during its deceleration as a function of the distance of said car from said selected landing;

speed regulating equipment connected to said time controlled speed dictation signal generating means and to said landing selector mechanism and during each trip generating an output signal in response to said time controlled and said distance controlled speed dictation signals;

a hoisting motor driving said elevator car; and

motor control equipment connected to said speed regulating equipment to receive its output signal and in accordance therewith control the speed of rotation of said hoisting motor and thereby control the speed of said car;

said speed regulating equipment operating in response to the reception of a signal to stop at a selected landing and generating an output signal which controls the speed of the car during deceleration in substantially the same predetermined manner as said distance controlled speed dictation signal would notwithstanding the continued reception of the time controlled speed dictation signal from said time controlled signal generating means which would otherwise cause said speed regulating equipment to control the speed of said car in a different manner.

28,283

THRESHOLD CIRCUIT FOR TONE-RINGER OR LIKE LOAD MEANS

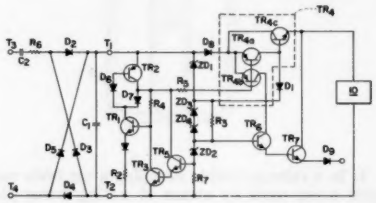
Michael C. J. Cowpland and Richard C. Foss, Ottawa, Ontario, Canada, assignors to Microsystems International Limited, Montreal, Quebec, Canada

Original No. 3,772,470, dated Nov. 13, 1973, Ser. No. 288,410, Sept. 12, 1972. Application for reissue Feb. 4, 1974, Ser. No. 439,065

Claims priority, application Canada, July 24, 1972, 147,766

Int. Cl. H04m *1/00*

U.S. Cl. 179—84 T **11 Claims**



1. A threshold circuit for energizing from a D.C. power supply source a first load means having first and second terminals, said circuit comprising a dummy load switchably interconnected across third and fourth terminals for connection to said power supply source when said load means is disconnected therefrom, said dummy load having fifth and sixth terminals and adapted to draw less current than said first load means, whereby the potential difference between said third and fourth terminals is greater by a value V_1 with said dummy load operatively connected therebetween than with said first load means so connected for a given power supply impedance, said fifth terminal connected to said fourth terminal of said power supply source and said sixth terminal connected through a first controllable switch means to the control element of a second controllable switch means, the control element of said first controllable switch means connected through said second controllable switch means to said third terminal, a fourth controllable switch means between said first terminal of said first load means and said third terminal, the control element of said fourth controllable switch means connected to the control element of said first controllable switch means and through a third controllable switch means to said fourth terminal, voltage threshold means comprising first and second series connected portions thereof and having a threshold value V_2, connected between said third terminal and the control element of said third controllable switch means, said second portion being connected to said control element of said third controllable switch means, and unidirectional current passing means connecting the junction between said first and second portions of said threshold means to said first terminal of said first load means and adapted to block current flow between said first terminal of said first load

means and said third terminal when said fourth controllable switch means is disabled, said second termnial of said first load means being connected to said fourth terminal, whereby a current path is established between said third terminal and said control element of said third controllable switch means enabling said third controllable switch means when the potential difference between said third and fourth terminals reaches said threshold value V_3, the breakdown voltages of said unidirectional current passing means and said second portion of said threshold means being such as to pass enabling current to the control element of said third controllable switch means when said fourth controllable switch means is enabled and the potential difference between said third and fourth terminals is within the range of values from (V_3-V_1) or lower to V_2.

PLANT PATENTS

GRANTED DECEMBER 24, 1974

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,670
ROSE PLANT

Arnold W. Ellis, Upland, and Herbert C. Swim, Ontario, Calif., assignors to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Sept. 13, 1973, Ser. No. 396,838
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—11 1 Claim

1. A rose plant of the hybrid tea rose class, substantially as herein illustrated and described, being of bushy, upright-spreading habit with abundant large dark green leaves, said plant being particularly notable in its large ovoid buds, usually singly supported on strong long purplish stems; in the large size, about five inches across, of the blooms, and by the pastel apricot color of the 40 or 50 petals and 5 to 10 petaloids; the blooms further being notable for their strong spicy or fruity fragrance, and their vase life as cut flowers, being from four to six days.

3,671
CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Nov. 12, 1973, Ser. No. 415,211
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—74 1 Claim

1. A new and distinct cultivar of chrysanthemum characterized particularly as to its uniqueness when compared to the parent cultivar Garland by its yellow flower color.

3,672
CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Nov. 12, 1973, Ser. No. 415,250
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—74 1 Claim

1. A new and distinct cultivar of chrysanthemum characterized by its anemone form, yellow flower color, and by its reliable and uniform 9 week response for tall treatment pot mum culture on a year around basis.

3,673
CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Nov. 27, 1973, Ser. No. 419,271
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—78 1 Claim

1. A new and distinct cultivar of chrysanthemum characterized particularly as to its uniqueness when compared to the cultivar Yellow Show-Off by its lack of non-breaking tendencies from a pinch at marginally high temperatures (above 70° F.); approximately ½" larger flower size; improved color retention and less reflexing of form resulting in 4–6 days longer bench life and durability under average home conditions; a darker yellow flower color; reduced tendency to show open centers in early spring and late fall flowerings; 2"–3" less vigor, and by its three to five days earlier response.

PATENTS

GRANTED DECEMBER 24, 1974

ERRATA

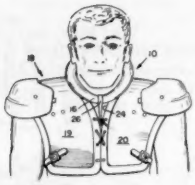
For CLASS	See PATENT NO.
260–296	3,855,675
034–009	3,855,719
053–306	3,855,749
062–217	3,855,836
212–008	3,855,954
261–018	3,856,901
424–258	3,856,909
424–275	3,856,910
424–331	3,856,911
264–041	3,856,914
424–078	3,856,919
260–307	3,856,923
179–090	3,856,982
174–151	3,856,983
313–371	3,857,037

PATENTS

GRANTED DECEMBER 24, 1974

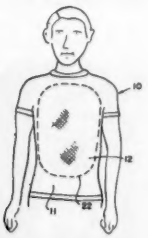
GENERAL AND MECHANICAL

3,855,631
PROTECTIVE NECK COLLAR
Donald N. Ettinger, Saint Louis, Mo., assignor to Hit-Away, Inc., Indianapolis, Ind.
Continuation-in-part of Ser. No. 397,731, Sept. 17, 1973, abandoned. This application Jan. 23, 1974, Ser. No. 435,840
Int. Cl. A41d *13/00*
U.S. Cl. 2—2 **8 Claims**



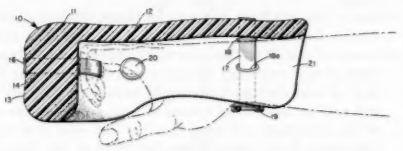
1. A protective neck collar for use in conjunction with protective athletic shoulder gear which has a head opening formed therethrough, comprising an inflatable annular tube of a pliable material adapted to extend circumferentially about a player's neck between the protective shoulder gear and the player's head, and means for connecting said tube to the protective shoulder gear to prevent displacement of said tube about the player's neck, the size and shape of said tube being such that said tube generally conforms to the front to rear contour of the head opening in the protective shoulder gear and substantially fills the gap between the player's protective shoulder gear and head, said tube forming an air cushion which when inflated encircles the player's neck and compresses slightly with little effort to accommodate normal head and neck movements, and is pinched between the player's head and protective shoulder gear upon sharp blows to the head and neck to absorb said blows and prevent injury due to extreme neck flexion in any direction.

3,855,632
BULLET RESISTANT UNDER GARMENT
Richard C. Davis, Box 581 Muckle Rd., Central Lake, Mich. 49622
Filed Jan. 7, 1974, Ser. No. 431,379
Int. Cl. F41h *1/02*
U.S. Cl. 2—2.5 **5 Claims**



1. A bullet resistant garment, such as a conventional undershirt for wearing upon and covering a human torso, comprising:
- a cloth panel overlapping the front portion of the garment body and arranged to cover generally the chest and abdomen portions of the torso;
- a bullet resistant pad arranged between the panel and the overlapped garment portion and formed of a number of sheets of tightly woven fabric formed of a heavy gage nylon type thread;
- such sheets being fastened together, as by stitching, generally along their edge areas and otherwise being substantially free of positive securement together for limited individual flexing and planar movement of each sheet relative to the other sheets;
- at least one of the sheets having an edge portion extending outwardly of the perimeter of the pad and said edge portion together with the overlapping edge portion of the panel being fastened to the overlapped portions of the garment for thereby securing the panel, pad and garment body together;
- whereby said garment is relatively lightweight, flexible, non-bulky and may be concealed within outer garments and is substantially bulletproof at the pad.

3,855,633
KARATE GLOVE
Jhoon Goo Rhee, 2525 No. Ridgeview Rd., Arlington, Va. 22207
Continuation-in-part of Ser. No. 252,054, May 10, 1972, abandoned. This application Aug. 30, 1973, Ser. No. 393,034
Int. Cl. A41d *13/08*
U.S. Cl. 2—18 **9 Claims**



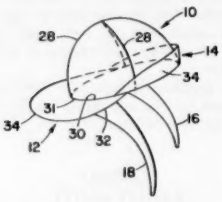
1. A protective glove for use in the art of karate and the like comprising casing means, resilient foam means disposed within said casing means, said glove adapted to fit over the back of the hand and fingers of the wearer to protect the hand from injury, said glove having a thickened front end portion, strap means disposed in said front end portion and means extending said strap means through said forward part of said glove, whereby the fingers of the wearer can grasp said strap and maintain said front portion in close contact with the fingers, and retaining means for retaining the rear end portion of said glove on the rearward portion of the hand.

3,855,634
RAIN CAP
Richard C. Gregg, 4007 Nelson Dr. N.W., Huntsville, Ala. 35810
Filed Oct. 16, 1972, Ser. No. 297,963
Int. Cl. A42b *1/06*
U.S. Cl. 2—172 **1 Claim**

1. A rain cap comprising:
- a generally hemispherical enclosure of thin, water-repellant material adapted to fit over the head and cover the top and portion of the sides and rear of the head of the wearer;
- a discrete rear flap of thin, water-repellant material attached to and around substantially the rear half of the lower edge region of said hemispherical enclosure terminated at front edges of said rear flap and said flap being connected and biased to naturally extend rearward sub-

stantially in a plane perpendicular to the vertical axis of the hemispherical enclosure;

a pair of generally triangular elongated tying strips of soft net material, a triangular base end of one tying flap being fixedly connected to a front-bottom edge region of said rear flap, on one side of said rain cap, and the other tying flap being fixedly connected in a like manner to a front-bottom edge region of said rear flap, on the other side of said rain cap, whereby said rain cap may be secured to the head by tying the opposite apex ends of said tying flaps together and thereby pulling said rear flap downward over the rear of the neck of the wearer and thus securing the rain cap to the head;



a discrete front flap of thin, water-repellant material secured to and extending from the bottom edge of substantially the front half of said hemispherical enclosure and terminated on opposite sides of said enclosure, said front flap being connected and biased to naturally extend upward;

whereby the said front flap may be biased upward or downward independent of the biasing of the rear flap; and

the ends of said front flap extending above and overlapping ends of said rear flap, whereby rain falling on the front half of said enclosure is caught between said front flap and said enclosure and caused to flow around to the sides of the enclosure and onto the rear flap, and thus rain is prevented from falling down the front of the head and face of the wearer.

3,855,635

TWO PIECE HOSPITAL GOWN

Ceneida Ramirez, 50 N. Second St., Meridan, Conn. 06450

Filed May 17, 1973, Ser. No. 361,358

Int. Cl. A41d *9/00*

U.S. Cl. 2—114 **2 Claims**

1. A hospital gown which is formed of sheet material of two-part construction comprising

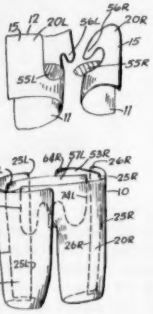
a blouse section which is formed from a sheet of material in which a neck opening is formed together with

a pants section which is formed from two similar rectangular sheets, each of which is cut and shaped to form a pants leg, such that two pants leg sections are joined together in interlocking fashion and without waste of any material to form a completed pants, where

each said rectangular sheet is bound by a top edge, two side edges and a bottom edge, with a slit formed in the sheet that extends from the mid section of the top edge of the sheet to the mid section of the sheet, said slit joining a curved slit which bounds an inverted U-shaped section of sheet that is joined to the rectangular sheet along a crotch line generally parallel to the top and bottom edges of the sheet, said U-shaped section forming a tab when folded about said crotch line, with

each said pants leg section formed by folding a said sheet about an axis parallel to the two side edges of the sheet, with the side ends bounded by the side edges of the said sheet joined together, such that the bottom edge of the sheet is formed in a continuous closed loop and the top edge of the sheet is formed in an open U-shaped configuration;

said pants section being formed by the joining together of a first and a second such pants leg section, with the two joined sections oriented together along their respective crotch lines to form a common crotch line, and with the top edges of both pants leg sections lying on a common plane, and interlocked by the tabs of both sections folded about the common crotch line so that the tab of a first leg section is folded over the common crotch line of both sections with said tab overlying the folded tab of the



second leg section which is bent inside the second leg section, and with the adjacent sides of each pants leg section, that are bounded by the top edges of each pants leg section and by the adjoining edges of the slit in each pants leg section, fastened together in overlapping configuration to form the upper front and upper rear sections of the pants section, with the said upper front and upper rear sections being reinforced by the overlapped sections of sheet.

3,855,636

NECKTIE SHAPING DEVICE

Edward L. Gnys, 315 High St., Central Hills, R.I. 02863

Filed Feb. 4, 1974, Ser. No. 439,595

Int. Cl. A41d *25/08*

U.S. Cl. 2—153 **3 Claims**

1. A tie knot shaping and holding device comprising a flat planar member having an elongated shank, an enlarged integral head at the upper end of said shank, opposite sides of said head having gently rounded lower portions, said sides then

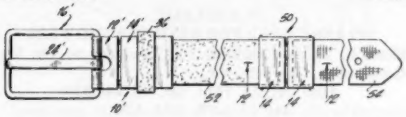
converging to a gently rounded apex at the top of said head, said head being adapted to be pushed upwardly into a tie knot between the front and rear portions of a tie until the convergent upper portion of the head is within the knot while the wider, curved lower portion of the head remains below the knot, spreader means associated with said head and comprising bars extending outwardly from opposite sides of said head at said wider, curved lower portion thereof, said spreader means also being of flat, planar construction and functioning to maintain the tie material below the knot in spread position, and means for holding said device properly positioned with respect to the tie.

3,855,637

BELT REVERSING MECHANISM

Benjamin Luger, 28-56 210th St., Bayside, L. I., N.Y. 11360

Filed Nov. 5, 1973, Ser. No. 412,731
Int. Cl. A41f *19/00*
U.S. Cl. 2—301 **4 Claims**



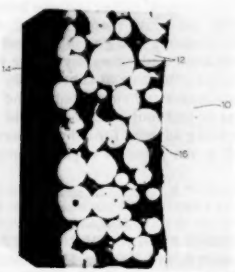
1. A reversible and adjustable belt comprising: a buckle; a belt section; a clamping member, said clamping member adjustably connecting said belt section to said buckle, said clamping member including a belt housing, a gripping member pivotally mounted on said belt housing, said gripping member being adapted to pivot between an open position defining a belt receiving slot through which said belt section is adapted to be inserted into said belt housing and a closed position wherein said clamping member is adapted to engage said belt section to secure it within said housing; and means for rotating said belt section at least 180° about its longitudinal axis relative to said buckle so that the inner surface of said belt section will become the outer surface.

3,855,638

SURGICAL PROSTHETIC DEVICE WITH POROUS METAL COATING

Robert M. Pilliar, Toronto, Ontario, Canada, assignor to Ontario Research Foundation, Sheridan Park, Ontario, Canada

Continuation-in-part of Ser. No. 148,316, June 1, 1971, abandoned. This application May 16, 1973, Ser. No. 360,954
Claims priority, application Great Britain, June 4, 1970, 27110/70; Feb. 4, 1971, 3964/71
Int. Cl. A61f *1/24*
U.S. Cl. 3—1 **10 Claims**



1. A surgical prosthetic device comprising a composite structure consisting of a solid metallic material substrate and a porous coating of said metallic material adhered to and extending at least partially over the surface of said substrate to a thickness of about 100 microns to about 1,000 microns, said metallic material being substantially non-corrodable and non-degradable by body fluids,

said porous coating consisting of a plurality of small discrete generally ball-shaped particles of said metallic material bonded together at their points of contact with each other and said substrate to define a plurality of connected, interstitial pores uniformly distributed throughout said coating,

said particles being of a size and being spaced from each other to establish an average interstitial pore size of from about 20 microns to about 200 microns substantially uniformly distributed throughout said coating and a coating porosity of between about 10 and about 40 percent.

3,855,639

BEDPAN RINSER APPARATUS

Henry R. Billeter, Deerfield, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.

Filed Oct. 23, 1973, Ser. No. 408,375
Int. Cl. A47k *3/22, 11/08*
U.S. Cl. 4—7 **18 Claims**

1. In an apparatus for rinsing bedpans, the combination of a toilet bowl, a flush valve, and a flush tube connecting the flush valve with the toilet bowl, together with a diverter valve apparatus interposed in said flush tube, said diverter valve apparatus including a casing having an inlet and an outlet connected in said flush tube, and said flush valve, said casing, and said flush tube all being arranged in vertical alignment with the center line of said toilet bowl, said diverter valve apparatus supported on said casing on the front side of said flush tube, said casing having a horizontal cylinder portion on the front side thereof and a cylindrical valve member rotatable in said casing cylinder, a spray arm for rotating said valve member attached at one end to said valve member and projecting outward through a slot in said casing cylinder, said spray arm movable from a vertical position from the front side of said flush tube to a horizontal position over said toilet bowl for flushing a bedpan therein, said casing cylinder and said valve member having diverter passages therein which are closed in the vertical position of said spray arm and aligned in the horizontal position of said spray arm, whereby a portion of the water flow through said flush tube is diverted into said spray arm when the flush valve is operated.

3,855,640

BEDPAN RINSER APPARATUS

Jacques J. Filliung, Chicago; Axel B. Nelson, Mount Prospect, and Henry R. Billeter, Deerfield, all of Ill., assignors to Sloan Valve Company, Franklin Park, Ill.

Filed Oct. 23, 1973, Ser. No. 408,376
Int. Cl. A47k *3/22, 11/08*
U.S. Cl. 4—7 **14 Claims**

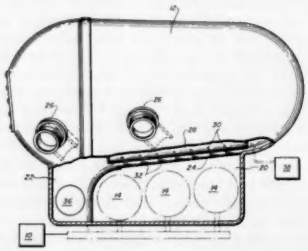
1. In an apparatus for rinsing bedpans comprising in combination, a toilet bowl, a flush valve for flushing said toilet bowl and a flush pipe connecting said flush valve with said toilet bowl, said flush valve and said flush pipe being arranged in vertical axial alignment and with the center line of said toilet bowl, a diverter valve mechanism interposed in said flush pipe and having an operating portion arranged on the front side of said flush pipe, said operating portion including a ball type valve having a spray arm projecting therefrom from the front side of said flush pipe and movable between a vertical position from the front side of said flush pipe to a horizontal position directly over the center portion of said toilet bowl, means in said ball valve for diverting a portion of the flushing water through said spray arm when the spray arm is moved into the horizontal position and said flush valve is operated, means in said ball valve for shutting off the flow of water through said spray arm when the spray arm is moved into the vertical position, and means for supporting said operating portion, said spray arm, and said ball valve entirely from the front side of said flush pipe.

3,855,641

RECIRCULATING SEWERAGE SYSTEM

George W. Foster, Los Angeles, and Alexander J. Campbell, Altadena, both of Calif., assignors to Koehler-Dayton, Inc., New Britain, Conn.

Filed Jan. 24, 1973, Ser. No. 326,436
Int. Cl. C02c *1/08;* **B01d** *29/20*
U.S. Cl. 4—10 **3 Claims**



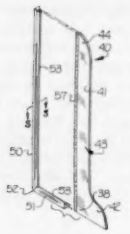
1. A recirculating sewerage system comprising a recirculating tank including effluent receiving and filtrate compartments separated by a vertically extending common wall,
at least one water closet adapted to discharge the effluent flushed therefrom into said receiving chamber,
said common wall including filter means for inhibiting the passage of bulk waste from said effluent receiving chamber into said pumping chamber,
a rinsing manifold extending adjacent to and along the top of said filter means and including a plurality of apertures opening downwardly proximate said filter means,
flush pump means communicating with said filtrate compartment,
means for conjointly directing a major portion of the pressurized filtrate discharged from said flush pump means to said water closet to flush same and a minor portion of the pressurized filtrate discharged from said flush pump means to said rinsing manifold.

3,855,642

SPLASH GUARD FOR BATH TUB SHOWERS

William E. Blitch, Charlotte, N.C., assignor to The Webline Corporation, Charlotte, N.C.

Filed Oct. 24, 1973, Ser. No. 409,079
Int. Cl. A47k *3/22, 3/14*
U.S. Cl. 4—149 **36 Claims**



1. A shower splash guard adaptable for use with a bath tub especially for preventing water from a wall mounted shower head from splashing between the wall and the adjacent side edge of a suspended shower curtain, said splash guard comprising an elongate, substantially rigid leg portion adapted to occupy an upright position, a heel portion and a toe portion collectively forming a foot portion on one end of said leg portion with said toe portion flaring laterally outwardly on said one end of said leg portion, said splash guard being several feet in length with at least the major portion thereof being of a width of only several inches and also being relatively thin as compared to the width thereof, first flange means connected to and extending along a longitudinal edge of said leg portion remote from said outwardly flaring toe portion, second flange means extending at substantially a right angle to said first flange means and connected to and extending along the lower edge of said foot portion, and said first and second flange means being adapted for adhesive securement thereof to a wall and to the adjacent upper surface of a bath tub, respectively.

3,855,643

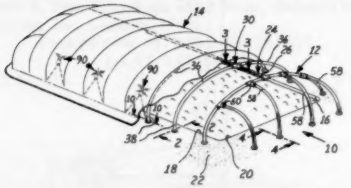
SWIMMING POOL COVERING APPARATUS

George N. Sanford, and William H. Sanford, both of 4820 Faculty Ave., Long Veach, Calif. 90808

Filed Nov. 23, 1973, Ser. No. 418,541
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.12 **9 Claims**

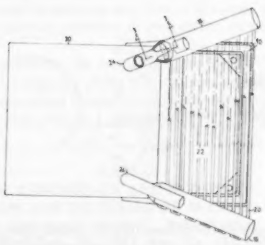
1. Swimming pool covering apparatus, comprising:

a frame having a longitudinally extending ridge pole;
rafters each of which has one end secured to the ridge pole, said rafters being curved downwardly to provide intermediate supporting legs and spacing the ridge pole above the surface of the pool;
end rafters extending longitudinally of the pool and laterally from the respective lateral end rafters, said end rafters also curving downwardly; the lower ends of said rafters terminating in substantially the same plane;
means for anchoring lower ends of the rafters to the deck of a swimming pool;
a cover of flexible sheet material disposed on the frame;
fixture devices attached to the cover. said devices being spaced apart marginally of the cover and upwardly of the



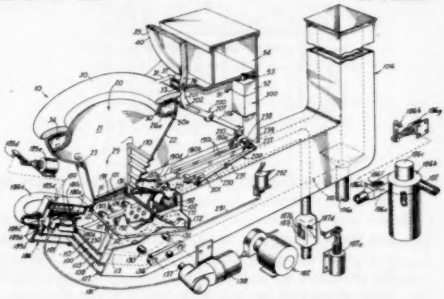
lower edge of said cover as well as upwardly of the swimming pool deck;
means engageable with said fixture devices for securing same to the deck of a swimming pool for securing the cover in place on the frame; said means for anchoring the lower ends of at least the lateral rafters to the desk of the pool comprise pin anchoring devices having a cylindrical body of resilient compressible material, a lower end of said pin anchoring devices being disposed in bores in a swimming pool deck, said pins having an annular flange intermediate their ends resting on the surface of the deck and said pins having a longitudinally extending bore and a split end portion, said bore tapering toward the lower end and a bolt having an externally threaded lower end portion which tapers at its free end.

3,855,644
DEVICES FOR ASSISTING IN THE BATHING OF BABIES AND INCAPACITATED PERSONS
Donald Cyril Benson, 195 Spoor St., Vryheid, South Africa
Filed Oct. 30, 1973, Ser. No. 410,984
Claims priority, application South Africa, Mar. 21, 1973, 73/1233
Int. Cl. A47k *3/12*
U.S. Cl. 4—185 B **3 Claims**



1. A device for supporting a person in a bathtub, comprised of a base member including a top surface and a bottom surface for engagement with the bottom interior of the tub, a support member engaged with the said top surface and including an upper surface inclined with respect to the plane of the said bottom surface for supporting the buttocks of the person, a pair of uprights mounted on said top surface and having at their upper ends headrest members, a hook member mounted on each said headrest member and including a curved portion for engaging in the armpit of the person to confine the person on the device and means supported jointly by said headrest members and extending between said headrest members for supporting the head, neck and shoulder of the person.

3,855,645
INCINERATING COMMODE
James I. West, Jr., 7856 Fielder Rd., Jonesboro, Ga. 30236
Continuation-in-part of Ser. No. 250,232, May 4, 1972. This application Aug. 10, 1973, Ser. No. 387,237
Int. Cl. A47k *11/02*
U.S. Cl. 4—131 **13 Claims**



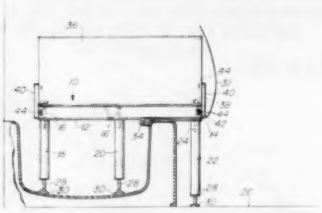
1. An incinerating commode for use in disposing of human waste comprising, in combination:
a. A commode body defining seat means permitting human waste to be introduced therethrough;
b. a combustion chamber located below and operatively associated with said seat means, said combustion chamber including a combustion pot for receiving waste introduced through said seat means;
c. Heat source means operatively associated with said combustion chamber for incinerating waste contained therein, said heat source means detailed for developing an incinerating flame into said combustion pot;
e. blower means operatively associated with said combustion chamber for directing an air flow therein;
f. liquid medium cooling means operatively associated with said combustion chamber for spraying a cooling medium therein after an incinerating operation, said liquid medium spraying being operable to direct a spray into contact with said combustion pot after completion of said heat source means and wherein the amount of spray is controlled to effectively steam clean and simultaneously cool said combustion pot without leaving a residue of said cooling medium; and,
g. means for initiating cyclic operation of heat source means, said blower means and said spraying of said liquid medium cooling means.

3,855,646
BATHTUB BENCH
Sophie Glickman, Randolph, Mass. Assignors: said Sophie E. Glickman, Evelyn Thomas, Brockton; Elaine Freedman, Holbrooke; and Sandra M. Zeltcer, Randolph, all of Mass., part interest of each
Filed Aug. 6, 1973, Ser. No. 385,889
Int. Cl. A47k *3/12;* **B60n** *1/06*
U.S. Cl. 4—185 S **4 Claims**

1. A bathtub bench comprising:
a seat having opposite ends;
at least one leg secured to one end of said seat and extending downwardly therefrom, said leg being adapted to be supported by said tub;
at least one intermediate leg mounted to said seat at the underside thereof and being adapted to stand in said tub to support said seat in cooperation with said first mentioned at least one leg;

the other end of said seat being of a length and constructed and arranged to extend transversely and outwardly beyond the periphery of said tub when said first and intermediate legs are disposed within said tub;

said bench further including at least one third leg disposed below said outwardly extending end of said seat and



extending downwardly toward the floor to support said outwardly extending portion of said seat; and

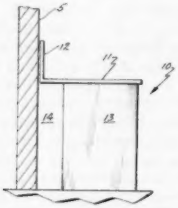
means located at the underside of said seat at the exterior end thereof to enable the lower end of a shower curtain to be inserted about the outer end of said seat and along the lower surface thereof thereby to guide water flowing down along said curtain to be returned into said tub.

3,855,647

CUP SINK FOR LABORATORY COUNTER TOPS

Paul J. Betts, Muskegon, Mich., assignor to Inter Dyne, Spring Lake, Mich.

Filed Nov. 5, 1973, Ser. No. 412,671
Int. Cl. E03c *1/18, 1/182*
U.S. Cl. 4—187 A **11 Claims**



1. A laboratory cup sink for mounting in a laboratory counter top along a narrow space at the rear thereof so that drain pipes can extend downwardly from the cup sink behind the cabinets of the counter, said cup sink comprising: a bowl of a generally curviform configuration, free of angular corners; a mounting flange projecting laterally from generally the top of said bowl, said mounting flange having rectilinear peripheral edges whereby an aperture for receiving said laboratory cup sink can be provided in a laboratory counter top by making rectilinear cuts through said counter top corresponding to the rectilinear edges of said mounting flange, and said mounting flange sloping downwardly slightly from its peripheral edges towards said bowl.

3,855,648

STRIKER MECHANISM FOR PLUMBING FIXTURES

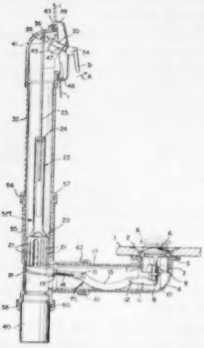
Gerald Pitman Dunham, Middlesex, N.J., assignor to American Standard Inc., New York, N.Y.

Filed Aug. 22, 1972, Ser. No. 282,792
Int. Cl. E03c *1/232*
U.S. Cl. 4—199 **9 Claims**

1. A striker component adapted to be housed within a tubular member on a plumbing fixture and being capable of reciprocation inside the tubular member for controlling a moveable stopper positioned in the discharge opening of a plumbing fixture comprising:

a unitary member having a plurality of spaced, elongated, flexible, generally parallel cantilever legs; and

means interconnecting said legs at one end and having an extension enabling said component to be reciprocated as a unit from a raised to a lowered position within said tubular member;



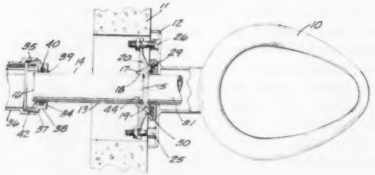
said legs being spaced a distance apart such that hair and other foreign matter contained in drain water will pass therebetween and said legs being of such length so that said interconnecting means will not enter in the path of the drain water when said striker component is in lowered position thereby preventing hair or other foreign matter from clogging the drain.

3,855,649

WASTE DRAIN CONNECTION FOR PLUMBING FIXTURES

Earl L. Morris, and Theodore J. Sally, both of Whittier, Calif., assignors to Acorn Engineering Company, Industry, City of Industry, Calif.

Filed Oct. 10, 1972, Ser. No. 296,044
Int. Cl. E03d *11/00*
U.S. Cl. 4—252 R **6 Claims**



1. An apparatus for connecting the drain pipe of a plumbing fixture to a waste-receiving pipe, wherein the waste outlet of said drain pipe has a gasket receptacle and a fluid-sealing gasket therein, comprising:

a pipe having at least two open ends;

a gasket compression ring and alignment yoke, said ring attached to the body of said pipe so as to effect a structural bond and a fluid seal therebetween;

means for adapting said gasket compression ring and alignment yoke to be connectable to a support structure on said fixture whereby said ring is movable towards or away from said gasket;

means for aligning said compression ring with said gasket, said gasket being disposed between said receptacle and said compression ring;

means for adjusting the compression force exerted on said gasket in said receptacle by said compression ring and alignment yoke wherein said force may be adjusted to obtain the desired fluid sealing force therebetween; and

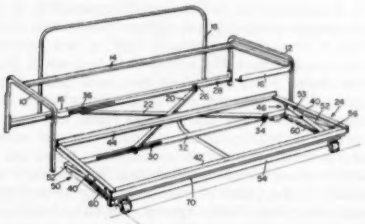
a sleeve slideably mated to said other pipe end in fluid-sealing relationship therewith, said sleeve adapted to be removably connected to said waste-receiving pipe.

3,855,650

HIGH RISE STUDIO COUCH OR BED

Herbert W. Neunherz; Robert G. Bryant, both of Gardner, and Donald R. Flye, Petersham, all of Mass., assignors to Gem Industries, Inc., Gardner, Mass.

Filed July 30, 1973, Ser. No. 384,125
Int. Cl. A47c *17/14*
U.S. Cl. 5—21 **9 Claims**



2. A bed comprising a mattress supporting frame, means to support the frame, spring biassed means to fold the supporting means to reduce the height of the frame from an extended position for use to a low position for storage, and means to lock the frame in both positions against accidental folding or accidental extension due to the spring,

the locking means comprising an arm, a recess in the arm, means to move the arm, a locking element, the recess receiving the latter and applying frictional stress thereto in one position of the arm and releasing the locking element in another position thereof,

wherein the locking element moves with the folding-extending of the supporting means, and the recess is inclined relative to the path of motion thereof,

the arm being free-ended and abuts the locking member at its free end in said one position of the arm, the arm locking the locking element in two different position of the latter,

a rod for actuating the arm to release the locking member, said rod extending along the mattress support, and

a front longitudinal frame member for the mattress support, the rod being located thereunder.

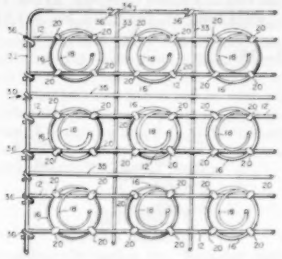
3,855,651

SPRING ASSEMBLIES AND BEDSPRING MADE THEREFROM AND METHODS OF MAKING THE SAME

Sam Larkin, 254 Beach 140th St., Belle Harbor, N.Y.

Filed Jan. 16, 1973, Ser. No. 324,239
Int. Cl. A47c *23/02*
U.S. Cl. 5—248 **3 Claims**

1. A bedspring comprising a substantially rectangular frame having two pairs of opposite sides; a plurality of longitudinal elongate spring assemblies spaced from each other a predetermined distance and each extending between and connected to one pair of opposite sides while being parallel to the other pair of opposite sides, each spring assembly comprising a pair of spaced substantially parallel wires, a plurality of coil springs uniformly spaced from each other twice said predetermined distance and mounted on said pair of parallel wires, coil springs of adjacent longitudinal spring assemblies being aligned along lines parallel to said one pair of opposite sides; and a plurality of transverse elongate spring assemblies each extending between and connected to said other pair of opposite sides, said transverse spring assemblies being spaced from each other twice said predetermined distance, each transverse spring assembly being positioned midway between adjacent



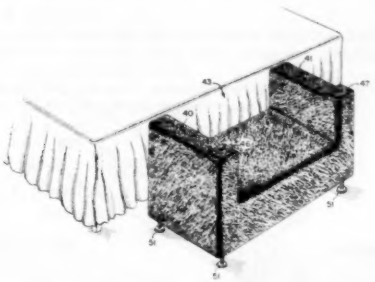
corresponding spaced coil springs on said longitudinal spring assemblies, said transverse spring assemblies being provided with coil springs uniformly spaced from each other said predetermined distance and aligned with said coil springs on said longitudinal spring assemblies, whereby the coil springs on both said transverse and longitudinal spring assemblies form an array of spaced springs spaced from each other said predetermined distance in both the longitudinal and transverse directions of the bedspring.

3,855,652

COUCH

Dana C. Nicholson, 8001 Lakecrest Dr., New Carrolton, Md. 20770

Filed Apr. 10, 1973, Ser. No. 349,760
Int. Cl. A47c *21/00*
U.S. Cl. 5—227 R **18 Claims**



1. A couch for supporting two person engaging in sexual intercourse, said couch comprising an elongated support structure having a first upper surface portion extending from a point intermediate the ends of said support structure upwardly toward one end of said structure at an angle with respect to the horizontal for supporting the back of one of said persons, and a second upper surface portion connecting with said first upper surface portion, a recess being formed in said support structure and dividing said second upper surface portion into two spaced arms for supporting the legs of said one person, said recess being located and dimensioned in a manner to accommodate and support the other person in a kneeling position between said spaced arms, said recess having a depth selected to accommodate said two persons en-

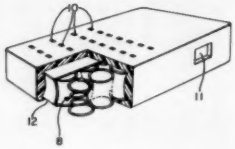
gaged in sexual intercourse, the heighth of said support structure adjacent said recess on the side thereof of said first support surface being equal to the heighth of said arms.

3,855,653

METHOD OF MAKING A MATTRESS AND SAID MATTRESS

Robert J. Stalter, Sr., Bowling Green, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sept. 17, 1973, Ser. No. 397,512
Int. Cl. A47c *23/04*, *7/14*
U.S. Cl. 5—351 **2 Claims**



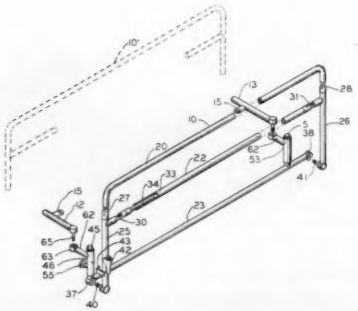
1. A polyurethane foam encapsulated spring mattress assembly, including a set of springs enclosed in a fabric envelope positioned within the mattress and covered with an open celled polyurethane foam, said envelope fitting the set of springs tightly when the mattress is unloaded, said foam being under compression when the springs are unloaded as well as when the springs are loaded.

3,855,654

STORABLE BED RAIL

William J. Pivacek, Elyria, Ohio, assignor to Invacare Corporation, Elyria, Ohio

Filed Aug. 2, 1973, Ser. No. 385,172
Int. Cl. A47c *21/00*
U.S. Cl. 5—331 **11 Claims**



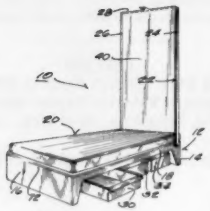
1. A bed rail assembly for beds comprising a bed rail movable from an upright position to a lowered position, support means for said bed rail adapted to be mounted on a bed frame, said support means being spaced from said bed rail in a direction transverse to the plane of the bed rail, and means extending between said bed rail and said support means and pivotally connected to each for permitting swinging movement of said bed rail toward said support means, whereby said bed rail is swingable in a plane generally perpendicular to the plane of the bed rail from a first position to a second position spaced from said first position in the direction of said support means.

3,855,655

SELF-MAKING BED

Robert L. Propst, Ann Arbor, Mich., assignor to Herman Miller Inc., Zeeland, Mich.

Filed July 12, 1973, Ser. No. 378,649
Int. Cl. A47c *21/00*
U.S. Cl. 5—317 R **11 Claims**



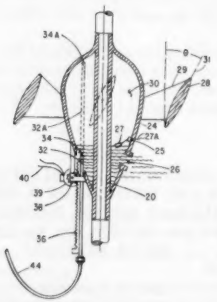
1. A combination bed and couch comprising, in combination: a support frame; a body support mounted on said support frame; a cover frame pivotally fixed to said support frame; cover means removably anchored to said cover frame, said cover frame being pivotal relative said body support and support frame between a first position wherein said cover frame extends above said support frame and body support generally perpendicular thereto such that said cover means hangs generally vertically from said cover frame and a second position wherein said cover frame lies generally within or parallel to the plane of said body support and said cover means covers said body support, said cover means including a first cover having an end looped around a portion of said cover frame, part of said end having a plurality of resiliently deformable hook-shaped elements and another part having a plurality of loop elements said hook elements being releasably engageable with said loop elements when said end is looped around said portion of said cover frame to releasably anchor said first cover to said cover frame.

3,855,656

UNDERWATER BUOY FOR A RISER PIPE

Kenneth A. Blenkarn, Tulsa, Okla., assignor to Amoco Production Company, Tulsa, Okla.

Filed Mar. 30, 1973, Ser. No. 346,529
Int. Cl. E21b *17/00*
U.S. Cl. 9—8 R **12 Claims**

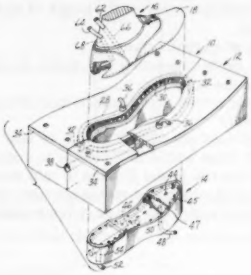


1. An underwater buoy for a riser pipe which extends from an underwater well to a vessel supported by a body of water which comprises:

a hollow shell attached to said riser to give an upward buoyancy force thereto;

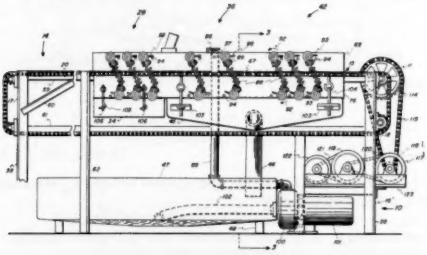
non-vertically directed hydrofoil means attached to said shell for directing said shell upwardly through said water in a non-vertical direction to avoid striking said vessel in event said riser pipe fails below said shell.

3,855,657
SHOE MOULDS
G. James Mazzotta, 40 Waite St. Extension, Malden, Mass. 02148
Filed Nov. 12, 1973, Ser. No. 414,728
Int. Cl. A43d *9/00*; **A01j** *21/00*
U.S. Cl. 12—142 RS **11 Claims**



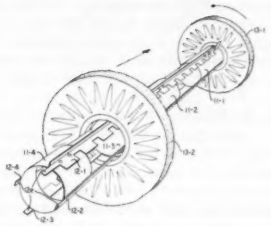
1. A shoe sole moulding assembly comprising a mould body having interior side and bottom walls defining at least a portion of a cavity for forming the edge and tread of a sole respectively, a channel formed in the side wall adapted to locate a foxing and vacuum means connected to the channel for retaining the foxing until after sole material has been injected into the cavity.

3,855,658
WINDOW SCREEN CLEANING APPARATUS
Francis L. Ford, 1110 Raymond Ave., Fort Pierce, Fla. 33450
Filed Nov. 1, 1973, Ser. No. 411,808
Int. Cl. A46b *15/00*
U.S. Cl. 15—77 **8 Claims**



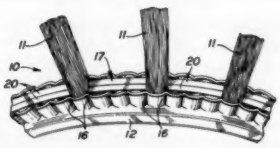
1. A cleaning apparatus for washing generally flat, framed window screens that have opposite side faces and which comprise an elongated rigid open frame that has opposite ends, a conveyor mechanism mounted on said frame for conveying the window screens along a horizontal path of movement which extends from a screen receiving station located at one of said ends to a screen delivery station located at the other of said ends, a first set of spaced apart and longitudinally extending wires which are mounted in a common plane under tension on said frame and which underlie and define said path of movement for supporting the flat screens in generally horizontal positions as they are conveyed along said path by said mechanism, an elongated brush assembly which is mounted of said frame and which generally underlies and extends transversely of said path of movement for brushing the underside face of the window screens that are conveyed along said path by said mechanism, said assembly having bristles and an operating position at which said bristles project upwardly through the spaces between said wires, a second set of spaced apart and longitudinally extending wires which are mounted in a common plane under tension on said frame and which overlie said path for resisting upward movement of the window screens during contact with said bristles, and a spray mechanism for spraying an aqueous detergent solution onto the window screens that are conveyed along said path by said conveyor mechanism, said spray mechanism comprising a header mounted on said frame and having a plurality of orifices arranged to project sprays of the detergent solution through the spaces between the wires of said second set, means for collecting detergent solution projected by said orifices including a trough mounted on said frame and located below said path of movement, and means for recycling the collected detergent solution to said header.

3,855,659
ROTARY BROOMS
Stanley R. Grambor, 38 Sutton Dr., Berkeley Heights, N.J. 07922
Filed Dec. 4, 1972, Ser. No. 311,531
Int. Cl. A46b *3/08*
U.S. Cl. 15—181 **15 Claims**



1. Apparatus for use with brush segments to form a rotary broom,
which comprises
an elongated casing having a plurality of support and guide members extending along said casing and positioned about the periphery thereof,
each support and guide member having positionable tabs for retaining the brush segments on said casing.

3,855,660
BRUSH SECTION
Arthur E. Drumm, Rt. 1, Marysville, Ohio 43040
Filed Aug. 21, 1973, Ser. No. 390,210
Int. Cl. A46b *13/02*
U.S. Cl. 15—181 **6 Claims**



1. A brush section comprising a body of metal of channel cross-section opening outwardly with opposed outwardly extending flanges, a filler channel of deformable material

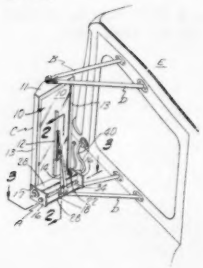
positioned in said metal channel and also opening outwardly, said filler channel having opposed outwardly extending flanges, said last-named flanges having notches formed therein at spaced intervals to provide pairs of opposed notches to produce bristlereceiving pockets at spaced positions where the flanges of the metal channel are exposed, bunches of bristles of U-form having the U-ends thereof disposed in said pockets, a continuous retainer member disposed in said filler channel and extending through said U-ends of the bristles to retain them in the channel, said flanges of the metal channel and of the filler channel being deformed at a position outwardly of the retainer member so that the flanges of the metal channel engage the outwardly extending bunches of bristles and the outwardly extending opposed flanges of the filler channel are in contact to fill the spaces between the respective spaced bunches of bristles.

3,855,661

AUTOMOTIVE REAR VIEW CLEANING DEVICE

Lawrence R. Prince, 13932 Fairluck Avenue, Paramount, Calif. 90723

Filed Dec. 18, 1972, Ser. No. 315,924
Int. Cl. B60s 1/26
U.S. Cl. 15—250.01 **4 Claims**



1. A power operated wiper adapted to be removably mounted on a side view mirror of the type that includes an elongate mirror supported in a rigid frame defined by a pair of horizontal end pieces that are connected by first and second vertical side pieces, which frame and mirror are pivotally supported by a pair of horizontal vertically spaced brackets exteriorly of a vehicle and in a position to be viewable by the driver of said vehicle, said wiper when operating removing moisture and dirt from said mirror, said wiper including:

a. an elongate rigid housing assembly that includes a pair of end pieces that project therefrom, with the projecting portions of the end pieces being disposed in abutting contact with the exterior surface of said first and second side pieces adjacent one of said end pieces of said frame, said housing defining a confined space therein that is in communication with a longitudinal opening formed in said housing that extends between said end pieces;

b. means for removably securing said end pieces to said first and second vertical side pieces to rigidly support said housing in a fixed position relative said frame and in a non-obstructing position relative to said mirror supported thereon;

c. a first guide rod disposed in said housing and extending longitudinally between said end pieces;

d. a second rod rotatably supported inside said housing between said end pieces and laterally spaced from said first rod and parallel thereto, which second rod has first and second longitudinal spiral grooves therein that are angularly disposed to one another and extend in opposite directions, with said first and second grooves connected on the ends thereof;

e. a carriage in said housing that slidably engages said first and second rods, with said carriage including a first portion that extends outwardly from said opening in said housing;

f. first means on said carriage that is at all times in engagement with either said first or second grooves;

g. a spring loaded arm secured to said first portion of said carriage, which arm extends over said mirror, which arm has a free end portion;

h. a wiper blade supported from said free end portion of said arm, which blade is in pressure contact with said mirror; said an electric motor mounted on said vehicle in a position remote from said side view mirror for selectively rotating sai second rod at a desired speed in a first direction, with said carriage, arm, and wiper blade being alternately moved in opposite directions relative to said mirror to wipe moisture and dirt therefrom due to said first means alternately engaging said first and second grooves as said carriage traverses the length of said first and second rods;

j. a source of electric power;

k. flexible cable connecting said motor to said second rod to rotate the latter;

l. an electric circuit that connects said source of power to said motor;

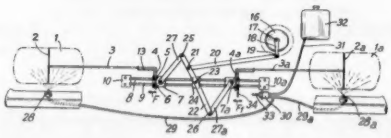
m. a multi-position electric switch in said circuit that is operable from within said vehicle to control the magnitude of electric power flowing to said motor to regulate the speed at which said motor operates and the rapidity with which said wiper blade is reciprocated across said mirror.

3,855,662

WIPER DEVICE FOR VEHICLE LIGHTING SYSTEMS

Raymond Fortin, Fresnes, France, assignor to Regie Nationale des Usines Renault, Billancourt and Automobiles Peugeot, Paris, both of, France

Filed Feb. 9, 1973, Ser. No. 331,109
Claims priority, application France, Mar. 28, 1972, 72.10911
Int. Cl. B60s 1/20, 1/44, 1/46
U.S. Cl. 15—250.01 **7 Claims**



1. An apparatus for wiping the screens of lighting elements on a vehicle comprising

a guide means adapted to be fixed to the vehicle,

two carriage means movable over the said guide means,

a wiper blade rod secured to each carriage means,

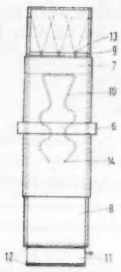
a wiper blade attached to each wiper blade rod disposed for reciprocating wiping movement over one of said screens as the carriage means moves to and fro on the guide means,

a drive means connected to the carriage means for moving it on the guide means comprising a rotatably driven shaft and linkage means comprising a crank attached to the shaft and having a crank pin, a secondary rod pivotally mounted on the guide means between the two carriage means, a main rod connected to the secondary rod and to the crank pin to angularly reciprocate the secondary rod about its pivot point as the shaft rotates, and a pair of rods pivotally connecting the secondary rod with the said carriage means, and means for rotating the shaft.

3,855,663
WIPING AND WASHING DEVICE FOR GLASS SURFACES, THOSE OF VEHICLES IN PARTICULAR

Horst Prange, Planegg, Germany, assignor to Con-Technik GmbH, Worthsee, Germany

Filed Jan. 18, 1973, Ser. No. 324,587
Int. Cl. B60s 1/46
U.S. Cl. 15—250.04 **12 Claims**



1. Wiping device for a glass, or the like material, surface on a vehicle or the like, wherein the surface has a predetermined length between two ends thereof and the surface has a predetermined width;

said device comprising:

a slide for supporting a wiper and also for covering the surface to be wiped; said slide having a length of at least said predetermined length; said slide having a width along its entire length of at least said predetermined width of the surface; said slide being generally parallel to the surface when it covers the surface; said slide being impervious to passage therethrough of water and dirt;

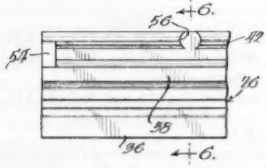
said slide having a leading edge which is movable across the surface from one end of the surface, at which the slide does not cover the surface, across the length of the surface to the opposite ends of the surface, at which the slide covers the surface and blocks passage of materials through the slide to the surface; means for moving said slide across the length of the surface;

a wiper for said surface carried on said slide and being located in the vicinity of said slide leading edge and being movable with said slide across the surface.

3,855,664
WIPER BLADE REFILL ELEMENT

Leo J. Wubbe, Beverly Shores, Ind., assignor to The Anderson Company, Gary, Ind.

Filed Feb. 1, 1973, Ser. No. 328,647
Int. Cl. B60s 1/04, 1/38
U.S. Cl. 15—250.42 **4 Claims**



1. A windshield wiper element comprising an elongate body of soft resilient material having

a. a wiper edge,

b. a relatively thick intermediate portion,

c. a relatively thin neck portion above the intermediate portion,

d. a relatively thick continuous retention bead along the upper edge to define a groove in each side wall with the base of the groove being the thin neck portion,

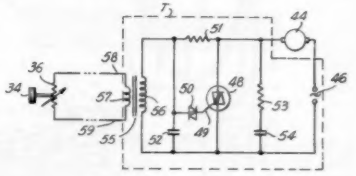
e. a single recess in the retention bead near at least one end of the body enabling threading of the wiping element into assembled relationship with a backing member, and

f. abutment means provided in the ends of the grooves for preventing the backing member from sliding axially out of said slot.

3,855,665
REMOTE CONTROL FOR VACUUM CLEANER MOTOR

Osten Schwartz, Varmdo, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Dec. 15, 1972, Ser. No. 315,438
Int. Cl. A47l 9/00
U.S. Cl. 15—339 **2 Claims**



1. A remote control arrangement for a vacuum cleaner provided with a motor having an electrical energy source, a flexible hose, a cleaning appliance, a coupling means operatively connecting the flexible hose with the cleaning appliance, said coupling means also functioning as a hand grip comprising

a. an electrical circuit adapted to connect the source of electrical energy to the motor and including

1. a thyristor device provided with a phase shifting network controlling the power input to the motor,

2. a standard type transformer generating a conventional hysteresis curve in which the primary winding thereof is a first variable impedance that is a part of the phase shifting network,

3. a second variable impedance including the secondary winding of the transformer and a variable resistor located at a distance from the motor, an operating member for the variable resistor located on said hand grip, and a low voltage conduit positioned on said hose coupling the variable resistor to the secondary winding of the transformer,

4. the magnitude of the first variable impedance which affects the phase shifting network being dependent upon and changeable by the second variable impedance,

5. said phase shifting network including a capacitor coupled in parallel to the primary winding of said transformer whereby a desirable curve shape of said control pulses of said thyristor is produced.

3,855,666
VACUUM CLEANER

Bolik Anders Erikson, Johanneshov, and Milos Vukotic, Skarholmen, both of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Sept. 25, 1972, Ser. No. 292,172
Int. Cl. A47l 5/34
U.S. Cl. 15—372 **8 Claims**

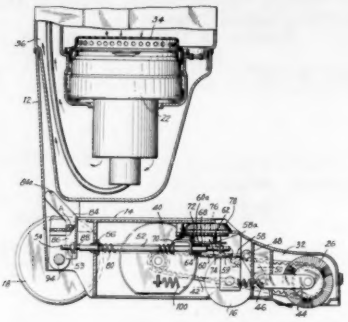
1. A vacuum cleaner comprising:

a. a hollow housing having an air inlet and an air discharge port,

b. a dust collector,

c. conduit means for conducting the air passing through the air inlet and depositing dust into the dust collector and thereafter passing the air out the air discharge port,

d. an agitator for the surface to be cleaned being located in or adjacent to the air inlet,
f. means for driving the agitator,
f means mounting the agitator for substantially vertical movement including:
1. a rotatable shaft mounted in said housing being operatively connected to the agitator,
2. a resiliently biased member operatively connected to the rotatable shaft for moving the same to yieldably



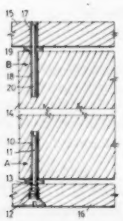
urge the agitator toward or away from the surface to be cleaned,
g. an operator for moving the resiliently biased member, and
h. said resiliently biased member including an elongated rod, a member mounted on said rod having an upstanding projection, said operator being provided with a surface that in one position thereof engages the upstanding projection in order to move the rod in a direction along the longitudinal axis thereof.

3,855,667

PIVOT HINGE

Gino Messina, 25 Margaret St., Southport,, 4215 Queensland, Australia

Filed July 31, 1973, Ser. No. 384,369
Claims priority, application Australia, Aug. 4, 1972, 9966/72
Int. Cl. E05d *5/10*
U.S. Cl. 16—168 **3 Claims**



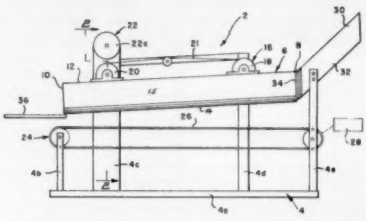
1. A door hingedly mounted within a door frame having top and bottom plates, an upper and lower hinge assembly; one said assembly including an elongated hollow bush lying in a hole in an edge of said door with its outer end flush with said edge, and a part having a pin and a threaded portion colinear with said pin threaded into a hole through its plate, said pin projecting into rotatable engagement in said bush; and the other said assembly including a first bush lying within a hole through its plate, a second bush lying in a hole in the edge of said door with its end flush with said edge, and a pin passing through both said bushes and rotatable relative to at least one bush; the axis of said hinge assemblies being aligned.

3,855,668

APPARATUS FOR SEPARATING EDIBLE CRAB MEAT FROM NON-EDIBLE PORTIONS OF COOKED CRABS

Richard T. Wenstrom, Hampton, Va., assignor to Sea Savory, Inc., Cambridge, Md.

Filed Jan. 10, 1973, Ser. No. 322,385
Int. Cl. A22c *29/00*
U.S. Cl. 17—71 **1 Claim**



1. Apparatus for separating meat particles of a predetermined size from a whole or debacked cooked crustacean, comprising
a. a frame (**4**);
b. a housing (**6**) comprising spaced apart side walls (**13, 15**) and spaced apart top and bottom walls (**12, 14**), said walls defining an elongated rectangularly shaped, open-ended chamber, said housing containing an inlet opening for receiving a crustacean body and an outlet opening for receiving a crustacean body, the bottom wall of said chamber containing a plurality of discharge openings equal to the predetermined size of the meat particles;
c. means (**16**) connecting said housing with said frame for vibratory motion in a direction normal to said chamber walls with a pre-selected amplitude of vibration;
d. means (**22**) vibrating said housing relative to said frame at a frequency of oscillation greater than 700 cycles but less than 1,700 cycles at an amplitude of vibration of ½ to 1½ inches, per minute, whereby a crustacean body introduced into said chamber through said inlet opening will be vibrated with relatively violent impacting force between said chamber walls to separate meat particles from the crustacean body; and
e. means (**24**) for collecting the meat particles that are discharged from said housing through said discharge openings; and means (**36**) for collecting the remaining portions of the crustacena body discharged from said chamber through said outlet opening.

3,855,669

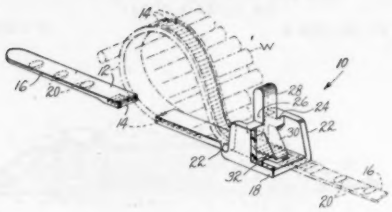
ADJUSTABLE STRAP WITH QUICK RELEASE

Engelbert A. Meyer, Union Lake, Mich., assignor to USM Corporation, Boston, Mass.

Filed Oct. 5, 1973, Ser. No. 404,010
Int. Cl. B65d *63/00*
U.S. Cl. 24—16 PB **2 Claims**

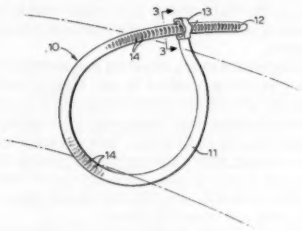
1. A molded one-piece plastic strap clamp for binding workpieces together comprising a flexible, elongate base portion having teeth disposed at least intermediate one side of its length, two substantially rigid leg portions upstanding in spaced relation from the opposite side of one end of the base portion, and a quick-disconnect lever hingedly supported by its junction with said leg portions for movement therebetween, said junction being disposed substantially midway of the length of the lever and equally spaced from the leg portions, the junction being at least four times the thickness of the base from said base portion, an end portion of the lever being

arranged to engage in gripping relation with some of the teeth of the base portion when the latter is looped about the workpieces and received between the leg portions, said end portion



of the lever being disengageable from said teeth to release the base portion upon torque being applied to another portion of said lever.

3,855,670
BUNDLING STRAP
Peter E. Brudy, Willowdale, Ontario, Canada, assignor to Dominion Auto Accessories Limited, Toronto, Canada
Filed Nov. 10, 1972, Ser. No. 305,482
Int. Cl. B65d *63/00*
U.S. Cl. 24—16 PB **4 Claims**



1. In a bundling strap, the combination comprising a one-piece strap made of flexible synthetic plastic material and including an elongated main body portion having a circular cross section,

a free end portion,

and a head portion through which the free end portion is adapted to be inserted to encircle one or more articles,

said head portion having an opening therethrough adapted to receive the free end portion of the strap and at least a part of the main body portion,

at least that portion of the body portion which is adpated to extend through said opening of said head portion being formed with diametrically opposed teeth,

said head having opposed lateral end surface portions adjacent the opening adapted to be engaged by said teeth and thereby hold said strap in position,

the sides of said opening in said head portion which extend to said end surface portions that are engaged by said teeth being tapered,

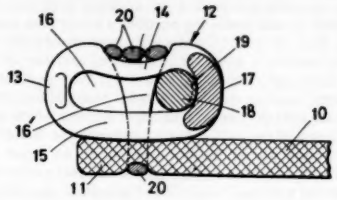
said teeth having radial and inclined surfaces,

said teeth having arcuate peripheral edges,

said sides of said opening which are engaged by said teeth being arcuate in transverse cross section,

said opening in said head portion being elongated transversely at an angularly spaced relation with respect to said opposed surface portions such that bodily rotation of the part of the body portion of the strap within the head will cause said teeth to disengage from said surface portions of said head so that the strap can be released.

3,855,671
ZIP FASTENER CONSTRUCTION
Yoshinori Fujisaki, Kurobe, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed July 26, 1972, Ser. No. 275,188
Claims priority, application Japan, July 31, 1971, 46-68372
Int. Cl. A44b *19/12*
U.S. Cl. 24—205.1 C **6 Claims**



1. In a slide fastener,

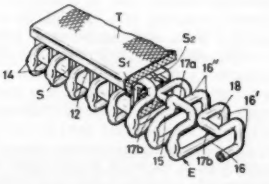
a. a stringer;

b. a row of coupling elements comprising, a plurality of coupling elements each having a coupling head and a pair of arms extending from said coupling head in a common direction transverse to a longitudinal direction of said row of coupling elements and defining a space therebetween, and a plurality of base portions connecting next adjacent coupling elements at ends of said arms remote from said coupling heads, one of said arms of each of said coupling elements having an inwardly bulging portion to define a narrow region more narrow than a portion adjacent said base portions of each of the spaces between each of said pair of arms;

c. an elongated core having a transverse width greater than the narrow regions of the spaces between said pairs of arms, said core being disposed in and solely at one end of each of said spaces between each of said pair of arms adjacent said base portions and maintained engaged with said base portions by said bulging portions of said pairs of arms to maintain alignment between said coupling elements; and

d. threads securing said coupling elements to said stringers.

3,855,672
CONCEALED ZIP FASTENERS
Ikuo Takamatsu, Uozushi, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 7, 1972, Ser. No. 278,473
Claims priority, application Japan, Aug. 12, 1971, 46-72406
Int. Cl. A44b *19/10, 19/32*
U.S. Cl. 24—205.1 C **6 Claims**



1. A concealed slide fastener comprising, a pair of carrier tapes each having an inwardly folded reinforced longitudinal edge and a series of apertures aligned along said folded longitudinal edge and defining a line of fold along which the tape is folded, a row of coupling elements each having a coupling head, upper and lower leg portions extending from said coupling head in a transverse common direction of said row of

coupling elements wherein said lower leg portion extends a greater distance than said upper leg portion, said upper leg portion being provided with a bent portion at an end remote from said coupling head and extending in a direction transverse to said row of coupling elements and away from said lower leg portion, an upstanding portion extending from an end of said lower leg portion opposite said coupling head in a direction essentially parallel thereto, an upper portion extending from an end of said upstanding portion opposite said lower leg portion in a direction toward said coupling head and essentially parallel to said lower leg portion, a lower base portion extending from an end of said upper portion opposite said upstanding portion in a lateral direction of said row of coupling elements and connecting to a lower base portion of a next adjacent coupling element, an upper base portion extending from said bent portion of said upper leg in a lateral direction of said row of coupling elements opposite the direction of said lower base portion and connecting to an upper base portion of a next adjacent coupling element, said carrier tapes being disposed with said reinforced longitudinal edge between said upper and lower leg portions and said upper base portions and said bent portions of said upper legs extending through corresponding ones of said apertures, a first line of stitches securing said upper and lower leg portions adjacent said coupling head to said folded edge and disposed substantially adjacent said apertures, and a second line of stitches securing said lower leg portion to said folded edge.

3,855,673

SLIDE-FASTENER STRINGER

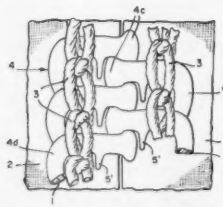
Helmut Heimberger, Grenzach, Germany, assignor to Opti-Holding AG, Glarus, Switzerland

Filed Aug. 21, 1972, Ser. No. 282,553

Claims priority, application Germany, Aug. 20, 1971, 2141687

Int. Cl. A44b *19/12*

U.S. Cl. 24—205.1 C **6 Claims**



1. A slide-fastener half comprising:

a stringer tape;

a coupling element of continuous synthetic-resin monofilament extending longitudinally on a surface of said tape, said element consisting of a multiplicity of integrally interconnected links each including a coupling head matingly engageable with a pair of similar coupling heads of a substantially symmetrical coupling element;

stitching securing said coupling element to said tape; and

locator means on said coupling element co-operating with said stitching for securing said links to said tape in substantially fixed positions, said locator means including a plurality of elongate barbs on at least some of said links set back from said coupling heads, said barbs projecting integrally from the monofilamentary body of said element, each barb being a sliver partly severed from said body whereby a shallow longitudinal depression is formed adjacent the barb and substantially complementary to the shape thereof, the barb having the same molecular orientation as said body upon being bent back into the adjacent depression but being stabilized in position to resist being thus bent back.

3,855,674

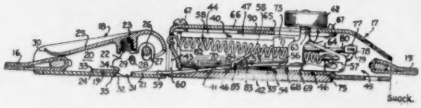
AUTOMATIC SEPARABLE FASTENER

Ralph Thiel, 1129 Wanda Ave., Seaside, Calif. 93955

Filed July 26, 1973, Ser. No. 382,917

Int. Cl. A44b *11/25*

U.S. Cl. 24—230 A **10 Claims**



1. The combination with the buckles of a seat belt arrangement in which a manually releasable buckle member has a spring loaded latch bolt adapted for locking engagement in an opening formed in a flat plate of the other buckle member upon insertion of such plate into the manually releaseable buckle, of means for automatically unlocking the buckle members following an excessive shock pull upon such seat belt arrangement comprising:

1. a housing having a bottom with a fore end formed contiguous to the flat plate of such other buckle member for extension of the plate into the manually releasable buckle member;
2. a spring loaded shock detecting pull member arranged for sliding guided movement in said housing and projecting from the aft end thereof for connection to a seat belt;
3. a spring loaded slide bar arranged for sliding movement in said housing and having a bolt engaging and camming end arranged within the opening formed in the flat plate fore end of said housing normally urged toward the bolt for lifting the bolt out of locking engagement with the flat plate fore end of said housing;
4. slide bar cocking means between said housing and said spring loaded slide bar for cocking the latter in retracted condition with its bolt engaging end withdrawn from beneath the bolt of the manually releasable buckle member for automatically releasing the same from the flat plate other than manually; and
5. a trip mechanism between said spring loaded slide bar and said shock detecting pull member for triggering said slide bar cocking means upon the exertion of an excessive pull upon said shock detecting pull member for releasing said spring loaded slide bar and the fore end thereof for movement toward and into engagement with the bolt of the manually releasable buckle member for releasing the same.

3,855,675

1-(2-FURANYLMETHYL)-1H-PYRAZOLO(3,4-B)PYRIDINE-5-METHANONES

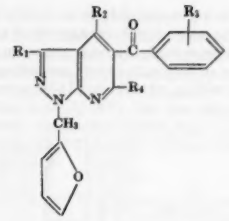
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 361,120, May 17, 1973, , which is a continuation-in-part of Ser. No. 292,363, Sept. 26, 1972, , which is a continuation-in-part of Ser. No. 146,812, May 25, 1971, abandoned. This application Apr. 22, 1974, Ser. No. 462,847

Int. Cl. C07d *49/20*

U.S. Cl. 260—296 H **14 Claims**

1. A compound of the formula



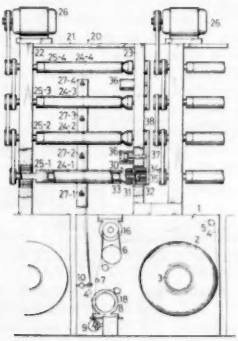
wherein R_1 is hydrogen or lower alkyl; R_2 is hydroxy, lower alkoxy, halo, amino or lower alkylamino; R_3 is hydrogen, halo, lower alkyl or lower alkoxy; and R_4 is hydrogen, lower alkyl or phenyl.

3,855,676

APPARATUS FOR DRAWING, SEPARATING AND WINDING FILAMENT

Takashi Kishida, and Sadao Kadokura, both of Hiroshima-ken, Japan, assignors to Teijin Limited, Tokyo, Japan

Filed Feb. 7, 1972, Ser. No. 224,048
Claims priority, application Japan, Aug. 3, 1971, 46-58466
Int. Cl. D02j 1/22
U.S. Cl. 28—71.3 **8 Claims**



1. An apparatus comprising: drawing means, said means drawing undrawn multifilament withdrawn without twisting from a rotatably supported package;

means for separating said multifilament drawn by said drawing means into a plurality of monofilaments; and

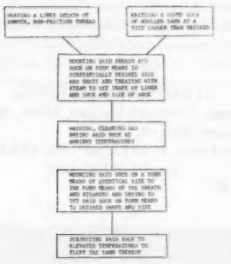
a winder having traversing means for concurrently traversing said monofilaments in the same direction, and a plurality of bobbins for winding up each traversed monofilament, wherein said bobbins are arranged vertically in columns and horizontally in parallel from the front to the back of said apparatus, said bobbins being supported and concurrently driven by a motor at their same one ends by respective spindles each partially engaged with said bobbin and also supported at the other ends by driven rotors each partially engaged with said other ends of said bobbin, said driven rollers being connected to pressure means for urging said bobbins to said spindles, said driven rollers being axially movable against the force of said pressure means when said bobbins are to be set or removed.

3,855,677

PROCESS FOR MANUFACTURING STUMP SOCKS AND LINERS FOR PROSTHESIS APPARATUS

David Belzidsky, 191, rue Saint Charles-15e, Paris, France

Filed July 24, 1972, Ser. No. 274,299
Int. Cl. D04b 39/00; D06c 5/00
U.S. Cl. 28—72 R **1 Claim**



1. Process for preparing a stump sock and liner sheath as a protective assembly, for use by amputees with prosthesis apparatus, comprising:

knitting a stump sock of a size larger than the final desired size;

weaving a liner sheath of substantially the size of the stump sock;

mounting said sheath and said sock on form means to establish identical shapes;

treating said sheath and sock while on said form means to preshape said sheath and sock;

cleaning, washing and drying said sock in the open air;

placing said sock on a shaped form of identical size to the form means of the sheath;

steaming and drying said sock on said form to finally shape and size the sock; and

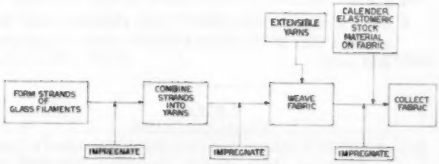
subjecting said sock to hot air to fluff the material thereof, whereby placing the sheath within the sock forms a protective assembly for a stump within prosthesis apparatus.

3,855,678

METHOD OF MAKING WOVEN SHEET FOR RUBBER REINFORCEMENT

Charles F. Schroeder, Toledo, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 777,817, Nov. 21, 1968, abandoned. This application May 12, 1971, Ser. No. 142,663
Int. Cl. D03d 15/00; D06c 27/00
U.S. Cl. 28—74 R **15 Claims**



1. The method of making a reinforcement member for rubber and rubber-like goods, said method comprising:

forming strands of gathered-together filaments of glass,

combining a plurality of said strands to form a first yarn,

forming a woven fabric including, in one direction, a plurality of said first yarns and, in parallel relationship, second yarns of a material having an extensibility greater than said glass, said fabric defining a pattern in which both first and second yarns sinuously engage with the other components of the fabric and in which the yarns of glass fila-

ments are longer and exhibit a sinuosity which is greater than the sinuosity of said second yarns, which are accordingly shorter per unit length of fabric than said first yarns, whereby a tensile load imposed on said fabric in the said direction will be borne first by said second yarns, causing a simultaneous elongation of said second yarns and a straightening out of the originally more sinuous glass yarns until said glass yarns assume a part of said tensile load, and

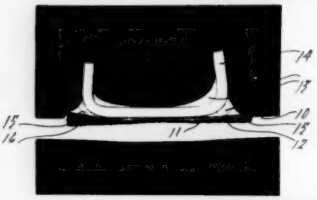
collecting the resulting woven sheet good.

3,855,679

ALUMINUM SOLDERING

Duane J. Schmatz, Dearborn Heights, Mich., assignor to Ford Motor Company, Detroit, Mich.

Filed Nov. 5, 1973, Ser. No. 413,157
Int. Cl. B23p *3/00*
U.S. Cl. 29—197 **11 Claims**



1. A method of effecting a corrosion resistant joint between the surface of an untreated aluminum part and the surface of a heat sensitive dissimilar metal part having a maximum tolerance temperature level, comprising:

a. applying an anhydrous flux to at least said surface of the untreated aluminum part,

b. applying a first solder to at least the fluxed surface of the aluminum part, said first solder consisting essentially of lead, 1–10 percent tin, a significant amount of silver up to 5 percent, and not over 0,1 percent antimony,

c. heating said surface and solder to a temperature above the maximum tolerance temperature level of said dissimilar metal part for a period of time sufficient to establish a silver rich interface between the aluminum and said first solder and thereafter permitting said surface and solder to cool,

d. fluxing said first solder on the aluminum part with a second flux,

e. applying a corrosion resistant second solder to the re-fluxed first solder, said second solder having a melting range below said maximum tolerance temperature level, and

f. melting said second solder while attachting said heat sensitive part to said heated second solder to complete said joint.

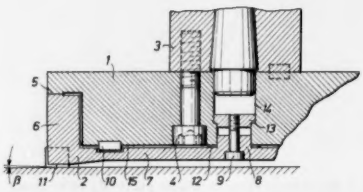
3,855,680

MILLING CUTTER

Sven Axel Olof Wirefelt, Sandviken, Sweden, assignor to Sandvik Aktiebolag, (formerly k/a Sandvikens Jernverks Aktiebolag), Sandviken, Sweden

Filed May 18, 1973, Ser. No. 361,649
Claims priority, application Sweden, May 26, 1972, 6996/72
Int. Cl. B26d *1/12*
U.S. Cl. 29—105 A **2 Claims**

1. A face milling cutting tool for milling plane, milled surfaces on workpieces of metals and similar materials, said tool consisting essentially of a supporting body (**1**) adapted to be fastened to a spindle nose (**3**) or rotary axle of a milling machine, and a milling cutter body (**2**) provided with inflexible cutting inserts (**11**) arranged on its periphery, said milling cutter body (**2**) being supportable on an annular plane support surface (**5**) on the outer peripheral part (**6**) of said supporting body (**1**), said support surface having approximately the same extension as that of said cutter body and taking up axial cutting forces, said milling cutter body (**2**) being essentially disk-



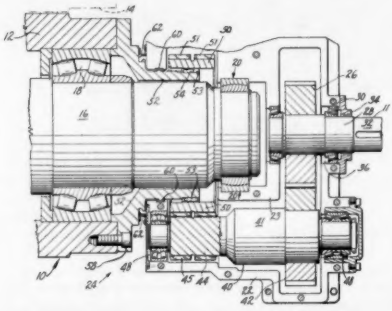
or shell-shaped and attached to the supporting body (**1**) in the central part of the cutting tool by holding means (**9, 13**) arranged for fastening and bending the milling cutter body (**2**), whereby to compensate for any small deviation of the axis of rotation of such splindle or axle and to tilt the cutting inserts (**11**).

3,855,681

DRIVE FOR SHELL-TYPE ROLLS

Achilles D. Andriola; Howard E. Kuehn; Warren C. Whittum, all of Orange, Conn., and Donald E. Wink, Penfield, N.Y., assignors to USM Corporation, Boston, Mass.

Filed Feb. 18, 1972, Ser. No. 227,373
Int. Cl. B60b *15/16*
U.S. Cl. 29—115 **8 Claims**



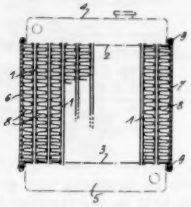
1. A shell-type roll and means for coupling said roll to a source of rotary motion comprising: a stationary shaft; pedestal means supporting said shaft at its ends; a shell-type roll disposed over said shaft intermediate its ends; bearing means supporting said roll for rotary motion on said shaft, said means proximate either end of said roll; an annular driving flange fixedly secured to said shell roll at a driving end; drive means disposed at said end of said roll proximate said flange adapted to engage a source of rotary motion; coupling means including a countershaft journaled in said pedestal means independent of said stationary shaft and a pinion-couple disposed on said countershaft fixedly secured thereto and adapted for concurrent rotary movement therewith, said pinion-couple at one extent thereof in operative engagement with said drive means; ring gear means disposed adjacent said flange and in driving engagement therewith and also in driven engagement with the other extent of said pinion-couple, whereby said shell roll may be driven rotatably on said stationary shaft by coupling means supported independently of said stationary shaft.

3,855,682

METHOD OF SOLDERING TOGETHER AN ALUMINUM PART AND A FERROUS OR CUPROUS METAL PART

Andre Chartet, Meudon, France, assignor to Societe Anonyme Des Usines Chausson, Asnieres, France

Filed Apr. 2, 1973, Ser. No. 346,758
Claims priority, application France, Apr. 6, 1972, 72.12153
Int. Cl. B21d *53/02*; B23p *15/26*
U.S. Cl. 29—157.3 R 11 Claims



1. A method for joining together an aluminum containing first part and a second part made of a metal selected from the group consisting of ferrous and cuprous metals comprising the steps of:

coating the surface of the second part with a soldering alloy having a melting point at a temperature lower than 320°C,

assembling the first part and the second part,

subjecting the assembly to an organic flux containing an aqueous solution of triethanolamine, diethylenetriamine and a metal fluoborate which can be reduced by aluminum at a temperature lower than 320°C, heating the assembly and the flux at least to said temperature whereby the metal in the fluoborate is reduced out and deposited as a protective coating on the aluminum of the first part after removing the alumina layer from the aluminum,

heating the fluxed assembly up to melting point of the soldering alloy, whereby the soldering alloy wets the aluminum containing part and is made adhering thereto, said protective coating forming an interpenetration layer.

3,855,683

METHOD OF CORRECTING ECCENTRICITY AND RUNNING OUT OF TRUE IN STAMPED STEEL WHEELS

Erich Philipp, Dabringhausen, Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed May 15, 1973, Ser. No. 360,493
Claims priority, application Germany, May 17, 1972, 2224027
Int. Cl. B21h *1/02*
U.S. Cl. 29—159.01 1 Claim

1. A method of correcting eccentricity and running out of true in a disc-type steel pressing wheel,

said wheel comprising a rim and a wheel dish,

said rim having first and second spaced apart tire supporting surfaces and first and second spaced apart shoulders,

said wheel dish having a center bore and an outer edge,

said rim being connected to said wheel adjacent said outer edge,

said wheel dish having first and second annular support surfaces adjacent said center bore,

said method comprising the steps of supporting one side of said wheel on a supporting calibrating tool,

said supporting calibrating tool having a first calibrating face engaging said first support surface and a second calibrating face engaging said first shoulder,

said supporting calibrating tool being spaced apart from the surface of said wheel between said first support surface and said first shoulder,

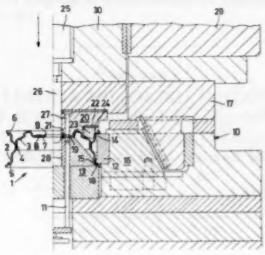
radially moving a plurality of segmental calibrating tools into engagement with said tire support surfaces of said rim at circumferentially spaced locations,

each of said segmental calibrating tools having first and second arcuate axially spaced calibrating faces engaging said first and second tire support surfaces,

said segmental calibrating tools being spaced apart from the surface of said rim between said first and second tire support surfaces when said calibrating tool is moved into engagement with said rim,

inserting a center bore calibrating tool into said center bore,

multiple stroke hammer pressing an axially movable calibrating tool against the other side of said wheel,



said movable calibrating tool having a first calibrating face striking said second support surface and a second calibrating face striking said second shoulder,

said movable calibrating tool being spaced apart from the surface of said wheel between said second support surface and said second shoulder when said movable calibrating tool is in hammer pressing engagement with said wheel,

holding said center bore calibrating tool in said center bore during said hammer pressing,

removing said center bore calibrating tool from said center bore after said hammer pressing is completed,

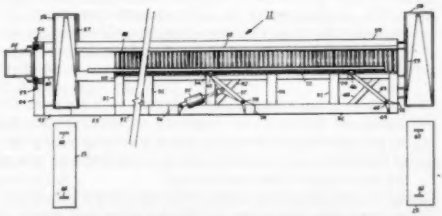
whereby said wheel rim and said wheel dish are accurately dimensioned and located with respect to each other.

3,855,684

NUCLEAR FUEL ROD BUNDLE HANDLING MEANS USEFUL IN AN IRRADIATED FUEL REPROCESSING SYSTEM

Wyvil R. Kendall, Berkley, Mich., assignor to General Electric Company, San Jose, Calif.

Division of Ser. Nos. 715,602, March 25, 1968, Pat. No. 3,621,742, and Ser. No. 86,092, Nov. 2, 1970, Pat. No. 3,827,579. This application Mar. 21, 1973, Ser. No. 343,297
Mar. 21, 1973, Ser. No. 343,297
Int. Cl. B23p *19/00*; B24b *7/00*
U.S. Cl. 29—200 D 3 Claims



1. Nuclear fuel rod bundle handling means capable of holding a nuclear fuel rod bundle in alignment with a nuclear fuel rod bundle disassembly means, said nuclear fuel rod bundle including fuel rod end securing means holding at least one

nuclear fuel rod in said nuclear fuel bundle, said nuclear fuel rod bundle handling means comprising

a. a plurality of rollers in a horizontal parallel array adapted to support a fuel bundle;

b. a fixed clamp member extending upwardly along a first side of said roller array;

c. a movable clamp member substantially parallel to said fixed clamp member extending upwardly along a second side of said roller array and mounted for movement toward and away from said fixed clamp member, adapted to clamp a fuel bundle therebetween;

d. means to move said movable clamp member toward and away from said fixed clamp member; and

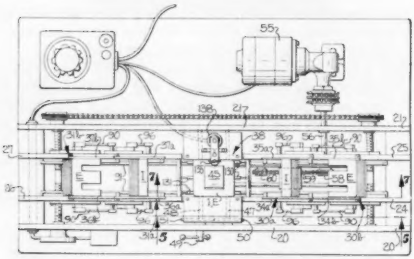
e. means to remove said fuel rod end securing means from at least one end of a fuel bundle positioned on said roller array.

3,855,685

LAMINATION ASSEMBLING APPARATUS

Berthold L. Nieder, Page Rd., RFD 3, Bow, N.H. 03054, and David L. Tyson, 203 Loudon Rd., Concord, N.H. 03301

Filed Nov. 19, 1973, Ser. No. 417,039
Int. Cl. H05k *13/00*
U.S. Cl. 29—203 L **12 Claims**



1. Apparatus for assembling laminations into a magnetic structure and comprising:

first and second magazine means for respectively retaining stacks of a first type of lamination and of a second type of lamination,

nest means mounted in predetermined spaced relation to said magazine means for receiving laminations being assembled into a magnetic structure and for supporting the magnetic structure so assembled,

a plurality of lamination picking means each mounted adjacent a corresponding one of said magazine means for engaging one of the corresponding type of lamination and for moving the one type of lamination from the one magazine means toward said nest means and to an intermediate position,

a plurality of lamination insertion means each mounted for movement between said magazine means and said nest means and each for inserting one of a corresponding type of lamination into said nest means in tandem with one of the other type of lamination, and

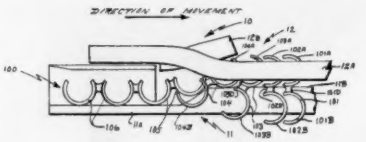
drive means operatively connected with said picking means and said insertion means for driving all of said means in coordinated movement for sequentially removing all from said magazine means a pair of one first type of lamination and one second type of lamination and for inserting the pair of laminations into said nest means.

3,855,686

CARTRIDGE LINK GUIDE ASSEMBLY

Ronald R. Snyder, Georgia, Vt., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 27, 1973, Ser. No. 419,306
Int. Cl. B23p *19/04*
U.S. Cl. 29—208 E **1 Claim**



1. A cartridge link guide assembly for moving cartridge links ejected from an automatic type gun which uses cartridges previously held by the cartridge links, wherein said cartridge links are of the type having a single upper loop portion and a lower double loop portion with a center section between the lower double loops, and wherein said cartridge links were previously detachably connected in a link-to-adjacent link fashion to form an endless disintegrating type cartridge belt, comprising:

a. a lower guide portion which includes a first bar member having a top surface, with said top surface configurated to accept and to support said upper single loop portion of each cartridge link, and with said top surface also configurated to accept, to support, and to guide said lower double loop portion of each cartridge link, and with said configurated top surface abutting with said center section of said double loop portion;

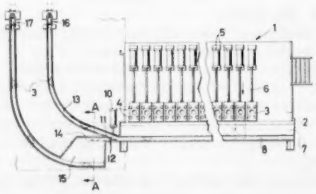
b. and, an upper guide portion which includes a second bar member and a third bar member that are essentially parallel to each other, and that are uniformly spaced from said first bar member to said lower guide portion, with said second and said third bar members configurated and positioned to guide said upper single loop portion of each cartridge link.

3,855,687

APPARATUS FOR FEEDING FLANGES

Shigeru Moriguchi; Tetsuo Takeuchi, both of Chibaken, and Yuzi Saito, Kanagawaken, all of Japan, assignors to Mitsui Shipbuilding and Engineering Co., Ltd., Tokyo, Japan

Filed May 24, 1973, Ser. No. 363,504
Claims priority, application Japan, May 29, 1972, 47-53083
Int. Cl. B23q *7/10*
U.S. Cl. 29—211 C **1 Claim**

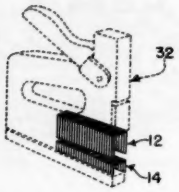


1. An apparatus for feeding flanges, comprising magazines for storing various flanges, flange discharging means for each magazine, a chute system having forked chutes for rolling the discharged flange, one of the forked chutes having a slant for inverting the rolling flange, and receiving devices for receiving the rolling flange before introducing them into a flange welding machine.

3,855,688
STAPLING METHOD

Friedrich Karl Knohl, Roselle, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Division of Ser. No. 178,956, Sept. 9, 1971, Pat. No. 3,788,187. This application Oct. 1, 1973, Ser. No. 400,748
Int. Cl. B23p *11/00*
U.S. Cl. 29—432 1 Claim

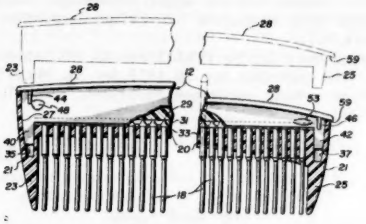


1. A method for attaching articles to low density material including the steps of positioning, in a single driving tool, a strip of identical staple diverging anvils, each having relatively short penetrating legs, in juxtaposition with a strip of identical staples, each having relatively long flexible legs, alternately driving first an anvil from the strip of anvils into the low density material followed by the driving of a staple over the anvil so as to flare the legs of the staple outwardly without protruding from the opposite side of the material, the anvil and staple thus being driven without moving or repositioning the driving tool.

3,855,689
METHOD OF MAKING A COMB

Jerome D. Schiffman, 116 Woodbine, Wilmette, Ill. 60091

Filed Jan. 2, 1974, Ser. No. 430,007
Int. Cl. B23p *19/04*; A45d *24/00*
U.S. Cl. 29—433 10 Claims

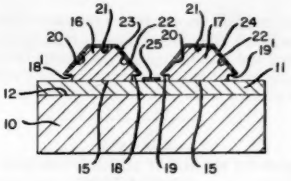


1. A method of making a hair comb, comprising:
providing an elongated support frame having a recess in the back portion thereof with a mouth opening therein and with a forward wall opposite thereto and having a series of spaced apart holes extending therethrough and opening into said recess and through said forward wall;
providing an elongated closure member adapted to close over said recess and having an elongated V-shaped groove in the front edge thereof;
cutting a long thin member composed of metal material into a plurality of shorter similar members to provide a plurality of rodlike members being circular in cross-section;
swaging said rodlike members to form the back end portions of said rodlike members into conically shaped head portions and to form the front end portions into gently curved blunt end portions to shape said members into teeth;
slipping individually the thus formed teeth through said recess and into corresponding ones of said holes until said head portions engage said forward wall; and
securing said closure member in place over said mouth with said head portions being seated in said V-shaped groove and being retained between said closure member and said frame.

3,855,690
APPLICATION OF FACET-GROWTH TO SELF-ALIGNED SCHOTTKY BARRIER GATE FIELD EFFECT TRANSISTORS

He B. Kim, Murrysville, and Michael C. Driver, Trafford, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 26, 1972, Ser. No. 317,992
Int. Cl. H01l 7/36, *5/00*, *29/48*
U.S. Cl. 29—571 8 Claims



1. A method for making a self-aligned field-effect transistor comprising the steps of:
a. forming a masking layer having at least two spaced apart windows therethrough on a planar surface of a semiconductor body having two impurity regions therein of different conductivity forming an abrupt change in impurity concentrations between impurity regions and having one impurity region adjoining said planar surface;
b. epitaxially growing facets of the same conductivity type as the impurity region adjoining the planar surface from said surface through said windows and overgrowing edge portions of said masking layer at said windows to form overgrowth portions on said facets;
c. removing said masking layer to cause said overgrowth portions of said facets to overhang portions of the surface adjoining the facets and shield said portions of the surface against metal deposition;
d. depositing metal on the unshielded portions of the surface between the facets to form a self-aligned Schottky barrier contact to the surface; and
e. depositing metal on the facets to make electrical contacts therewith.

3,855,691
METHOD OF MAKING A MAGNETIC MATERIAL PART WITH SPATIAL DISTRIBUTION OF THE PERMEABILITY

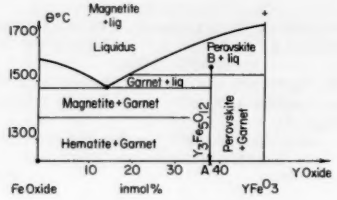
Andre Deschamps, and Georges Faye, both of Paris, France, assignors to Societe Lignes Telegraphiques Et Telephoniques, Paris, France

Filed Mar. 2, 1973, Ser. No. 337,308
Claims priority, application France, Mar. 7, 1972, 72.07816; Mar. 28, 1972, 72.10779
Int. Cl. H01f *3/08*
U.S. Cl. 29—608 10 Claims

1. A process for the manufacture of a solid magnetic article with a spatially uneven distribution of permeability which comprises:
providing a sintered solid piece of polycrystalline magnetically uncompensated initial F_1 material having a first permeability value,
heating said sintered solid piece at a temperature such that the free energy of said F_1 material is smaller than the free energy of another ferrimagnetic F_2 material having a

second permeability value different from said first permeability value,

transforming at said temperature a portion of said F_1 material into said F_2 material,



discontinuing said heating before the material of said piece is completely transformed into F_2 material, and

machining the resulting piece containing both F_1 and F_2 material so that at least one part of the outer surface of the machined piece consists of F_1 material.

3,855,692

METHOD OF MANUFACTURING CIRCUIT BOARD CONNECTORS

William P. Dugan, Ontario, Calif., assignor to General Dynamics Corporation (Pomona Division), Pomona, Calif.

Filed June 28, 1973, Ser. No. 374,747

Int. Cl. H05k *3/00*

U.S. Cl. 29—625 **37 Claims**

1. A method of manufacturing electrical circuit board connectors integral with at least one circuit mounted on a positioner board and projecting therefrom comprising the steps of:

bonding an aluminum sheet disposed between two sheets of a bonding agent to a positioner board having a copper clad on the unbonded side thereof, the aluminum sheet having a thickness of the desired connector height;

forming apertures through the bonded assembly at the locations of the desired projecting, integral connectors, the apertures having a size larger than the inside diameter of the desired connectors;

electro-copper plating the exposed aluminum surfaces in the apertures to a desired thickness;

electroless copper plating all surfaces of the assembly to a desired thickness;

nickel plating all exposed copper surfaces including the copper plated apertures to form nickel connectors therein;

applying a dry film photo resist layer to the top and bottom surfaces of the nickel plated assembly, the photo resist having chemical etchant resistant portions over the apertures and defining an electrical circuit on the nickel clad positioner board and chemical etchant susceptible portions over the remainder thereof;

chemically etching the assembly to remove all of the exposed nickel and copper therefrom;

removing the chemical etchant resistant portions of the photo resist to expose the apertures and the electrical circuit on the positioner board;

removing the bottom bonding agent sheet and any copper or nickel plating thereon to expose the bottom of the aluminum sheet;

dissolving the aluminum sheet to expose the nickel connectors projecting from the positioner board; and

removing the exposed copper plating from the outside of the projecting nickel connectors.

3,855,693

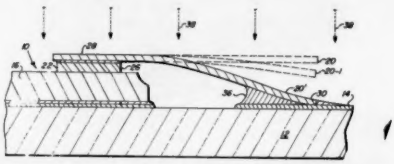
METHOD FOR ASSEMBLING MICROELECTRONIC APPARATUS

Charles Wayne Umbaugh, Phoenix, Ariz., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Apr. 18, 1973, Ser. No. 352,148

Int. Cl. H05k *3/32*

U.S. Cl. 29—626 **12 Claims**



1. A method for assembling microelectronic apparatus of the type including a planiform insulator with a conductive run formed on a surface thereof, and a circuit device having one end of an elongated lead of ferromagnetic material affixed to an active face of the device, the other end of the lead extending in cantilevered fashion from the device, the device attached face up to the surface of the planiform insulator, the cantilevered end of the lead aligned over the conductive run, the method comprising the steps of:

magnetically deflecting the cantilevered portion of the lead toward the conductive run to establish mechanical contact therewith, and

bonding the deflected lead portion to the conductive run.

3,855,694

METHOD OF WINDING DEFLECTION COILS FOR PICTURE DISPLAY TUBES

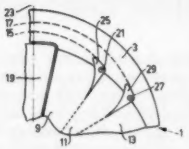
Martin Clemens Van Der Heijde, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 198,833, Nov. 15, 1971, abandoned. This application Aug. 20, 1973, Ser. No. 389,679

Claims priority, application Netherlands, Nov. 27, 1970, 7017341

Int. Cl. H01f *7/06*

U.S. Cl. 29—605 **5 Claims**

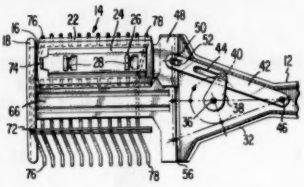


1. A method of sequentially making a plurality of saddle shaped television deflection coils for a cathode ray tube comprising winding a first coil section, winding a second coil section series coupled to said first coil section about said first section, forming at least one open space having a selected position between said sections during said second recited winding step, and obtaining a desired magnetic field generated by said coils when current is passed therethrough by testing the flux distribution of a selected coil and adjusting the number of turns in each of said sections during at least one of said winding steps of coils made subsequent to said selected coil, the adjustment depending upon results of said testing step.

3,855,695
HAIR CUTTERS

Abram Nathaniel Spanel, 344 Stockton St., Princeton, N.J. 08540

Filed Jan. 5, 1973, Ser. No. 321,343
Int. Cl. B26b *19/12*
U.S. Cl. 30—30 **16 Claims**

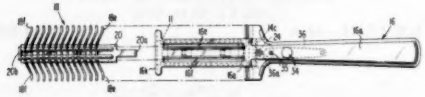


1. A hair cutter comprising:
a supporting frame,
a blade carriage for a double-edged blade supported by said frame,
a protective cage supported by and extending outwardly from the frame, said cage comprising a plurality of elements forming oppositely disposed rows of bights respectively spaced outwardly from said frame, the distance between said rows of bights being greater than twice the width of said double-edged blade,
a manually movable driving element, and
a range-of-motion-enhancing means disposed intermediate of said driving element and said carriage to assist in driving said carriage toward and away from said oppositely disposed rows of bights to enable positioning of the cutting edges of said blade at selected positions between each of said oppositely disposed rows of bights, said range-of-motion-enhancing means comprising a motion imparting member pivotable about a point on said supporting frame to provide a range of motion capability to drive said blade carriage from one to the other of said oppositely disposed rows of bights in which said double-edged blade is in juxtaposition to first one and then the other of said oppositely disposed rows of bights.

3,855,696
HAIR CUTTERS

Abram Nathaniel Spanel, 344 Stockton St., Princeton, N.J. 08540

Continuation-in-part of Ser. No. 321,343, Jan. 5, 1973,. This application Mar. 12, 1973, Ser. No. 340,379
Int. Cl. B26b *21/12*
U.S. Cl. 30—30 **51 Claims**

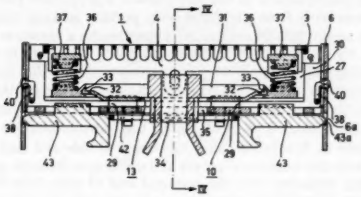


1. In combination with a hair cutter having a cage made up of a plurality of elements, each of relatively small cross-sectional area, forming at least one row of apexes,
a blade carrier for supporting a blade for lateral movement in either of two directions, respectively toward away from said apexes,
a support for said blade carrier,
driving means engaging said blade carrier for producing said lateral movement thereof,
means for mounting said cage and said blade carrier for relative longitudinal movement of one of them, relative to the other, to expose said blade carrier for unobstructed removal therefrom and placement thereon of said blade, and
means for preventing said relative longitudinal movement in all but one of its lateral positions.

3,855,697
SHAVING HEAD FOR DRY-SHAVING APPARATUS

Gerald Meyer, and Leo Buzzi, both of Klagenfurt, Austria, assignors to U.S. Phillips Corporation, New York, N.Y.

Filed Mar. 1, 1973, Ser. No. 337,090
Claims priority, application Austria, Mar. 1, 1972, 1697/72
Int. Cl. B26b *19/10*
U.S. Cl. 30—34.1 **6 Claims**

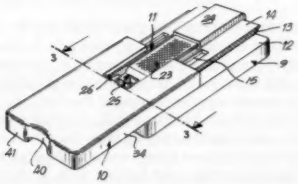


1. In a shaving head for a dry shaving apparatus, the shaving head including a shaving section having a shaving shear plate and an adjacent and cooperating shaving cutter reciprocably movable along their common longitudinal axis, a trimmer having a trimmer shear plate and an adjacent and cooperating trimmer cutter reciprocally movable along their common longitudinal axis which is parallel to said shaver section axis, drive means coupled to both of said cutters to produce common reciprocal motion, the improvement in combination therewith, wherein said trimmer shear plate and trimmer cutter are channel-shaped in cross-section transverse of said longitudinal axes and are generally concentric, each channel defining a bottom part, side walls extending outward of the bottom part, and top edges of said walls with cutting combs defined on corresponding and adjacent top edges of the trimmer's shear plate and cutter, and said shaver section is situated within said channel shape of said trimmer, with the shaver and trimmer cutters being spaced apart, the shaver shear plate being outward of the shaver cutter and the trimmer shear plate inward of the trimmer cutter, the shaving head further comprising spring means intermediate the two cutters urging them apart and resiliently against their respective shear plates.

3,855,698
ECOLOGY NAIL-CLIP RESERVOIR DEVICE

Kenneth R. Crosby, 37-45 W. 20th St., New York, N.Y.

Filed Apr. 19, 1974, Ser. No. 462,253
Int. Cl. A45d *29/02*
U.S. Cl. 30—124 **9 Claims**



1. A nail clip device comprising in combination: an enclosure means including a bottom member defining front and rear and opposite lateral portions and a bottom section interconnecting the portions and defining a recess in the nature of a slot extending from the front to rear portions in an upper

face of the bottom member and adjacent at least one of the side portions there being defined additional recess space communicating with the recess at a front portion, the additional recess space being defined also in the upper face of the bottom member, and there being a concave recess in the front portion in a front side wall therein defined in communication with a forward end of the slot recess, and the bottom member in the base of the slot recess forward end being shaped to stably receive a bottom face of a nail clipper means; a nail clipper means including upper and lower biased-apart clipping blades and a lever post mounted in the lower blade with pivotal joining structure defined in the upper portion of the lever post, and a lever arm defining steps therein to define proximal and distal lever portions spaced apart by a step portion, there being in juxtaposition to the step portion a projection extending downwardly from the distal lever portion making contact with an upper face of said upper upper blade, a terminal end of said distal lever portion being pivotably attaching to and being attached to the pivotal joining structure such that downward pressure on a terminal end of the distal lever portion is closable together of the upper and lower blades; and an upper top member shaped to fit on top of the bottom member and to enclose therebeneath said nail clipper means and said slot recess and said additional recess and defining a through space at an end mounted over the terminal end of said distal lever portion for exterior access to press downwardly the terminal end of said distal lever portion.

3,855,699

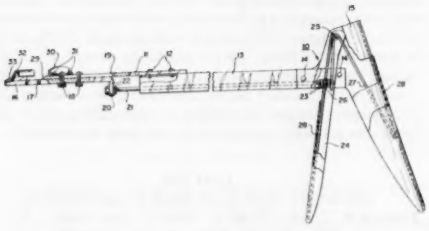
FLOWER CUTTER

Dante J. Charlett, R.D. No. 1 Box 73, Cabot, Pa. 16023

Continuation-in-part of Ser. No. 321,701, Jan. 8, 1973, abandoned. This application Apr. 24, 1974, Ser. No. 463,609

Int. Cl. B26b *13/26*

U.S. Cl. 30—135 **5 Claims**



1. An instrument for cutting plant stems and the like, of the type comprising a tubular pole, a pistol-grip handle attached to one end of the pole for supporting it in one hand, a lever pivoted on the handle and arranged to be pivotally squeezed toward said handle by the fingers of the hand by which the handle is held, and a rod telescopically extending through said tubular pole and connected to said lever for actuation thereby, wherein the improvement comprises a knife-edge blade fixed on the distal end of the said tubular pole, a shear member having a laterally extending slot therein for receiving a flower stem and being slidably carried by said blade, the edges of said slot being movable past the knife-edge blade in shearing relation, said shear member being connected to said rod and actuated so as to pull a stem in said slot over the knife-edge blade to effect a severing thereof when the said lever is squeezed toward the handle.

3,855,700

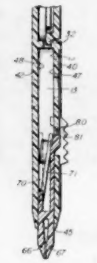
BLADE SCRAPER

Ronald L. Gerson, Newton, and Lawrence A. Caprio, Whitman, both of Mass., assignors to Louis M. Gerson Co., Inc., Middleboro, Mass.

Filed Apr. 19, 1974, Ser. No. 462,412

Int. Cl. B26b *1/08*

U.S. Cl. 30—162 **9 Claims**



1. A blade scraper comprising, a hand gripping casing,

a slide mounted in said casing and having means for mounting and carrying a scraping blade having a cutting edge, said casing defining a chamber with first and second opposed slide surfaces and an opening to the outside of said casing,

said slide having resilient first and second spring legs biased into engagement with said surfaces respectively,

pressure actuated locking means for locking said slide in a first retracted position with a scraper blade carried therein wholly within said chamber and a second operative position with said cutting edge exposed through said opening,

said locking means comprising first and second cutouts defined by said casing and a pressure button means constructed and arranged to be urged into said first cutout in said retracted position and said second cutout in said operative position whereby said button can be actuated by finger pressure from outside said casing to release said locking means,

said second cutout and said button means defining complementary surfaces for engagement to cause wedge locking of said slide in said second position upon application of a scraping force to said cutting edge.

3,855,701

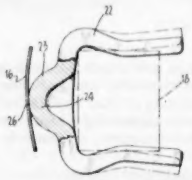
ORTHODONTIC APPLIANCE

Joseph A. R. Le Clair, 4155 Moorepark Ave., San Jose, Calif. 95117

Filed Apr. 9, 1973, Ser. No. 349,219

Int. Cl. A61c *7/00*

U.S. Cl. 32—14 A **11 Claims**



1. An orthodontic appliance for securing a member to a tooth comprising a band fittable around the tooth, a clip secured to said band for holding said member to said tooth, a spacer between said band and said clip at the location at which

said band and clip are joined to thereby otherwise space said clip from said band, and means adhering said clip to said band at said location allowing said clip to be pivoted at said spacer at least about a first axis which is generally parallel to the surface of said band opposed to said clip toward and away from said band to adjust the orientation of said clip relative to said band as desired to accommodate said clip to said member.

3,855,702

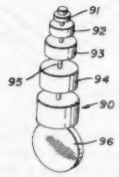
ENDODONTIC OPERATING AND SEALING METHOD AND APPARATUS THEREFOR

Oscar Malmin, 127 E. Wayne Ave., Akron, Ohio 44301

Filed Nov. 13, 1972, Ser. No. 305,973

Int. Cl. A61k *5/02*

U.S. Cl. 32—15 **2 Claims**



1. A substantially compressible gutta percha endodontic sealing cone for use in root canals, comprising an elongate substantially cylindrical body with first and second ends; said body having a plurality of offset shoulders at spaced intervals along its length to form progressively larger segments from said first to said second ends; and a handle projecting from said second end and being removably disposed centrally of said body and extending from a point adjacent said first end of said body.

3,855,703

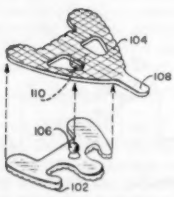
ACCESSORY RIM WITH DENTAL BITE CORRELATOR AND IMPRESSION AID

Edward C. Jarvis, 201 Meeting House Ln., Merion Station, Pa. 19066

Continuation of Ser. No. 241,170, April 5, 1972, abandoned. This application June 6, 1973, Ser. No. 368,417

Int. Cl. A61c *9/00*

U.S. Cl. 32—17 **2 Claims**



1. An impression aid for insertion between a conventional impression tray and the opposing jaw of a patient,

said impression aid comprising a first rim and second rim, said rims having an outer arcuate edge conforming to the shape of the inside of the mouth, said first rim having a ball shaped protuberance extending therefrom, said protuberance being so located so as to maintain the spacing between said rims, said second rim having a socket extending therefrom, said socket receiving said protuberance in a rotatable manner, and a handle extending from one said rims, said impression aid permitting the patient to retain the impression tray in the mouth for as long as is required by the impression material and eliminating the need for the dentist himself to maintain the tray in position.

3,855,704

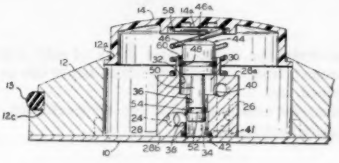
FOOT-OPERATED SPEED CONTROL FOR AIR-DRIVEN TOOL

Dwight A. Booth, 3529 S.E. Crystal Springs Blvd., Portland, Oreg. 97202

Filed Feb. 15, 1973, Ser. No. 332,605

Int. Cl. A61c *1/10*

U.S. Cl. 32—28 **15 Claims**



1. A foot control for controlling the speed of an air-driven motor, said control comprising:

a control block,

means defining a cavity extending into said block from an upper surface opening thereof,

said cavity including an upper piston chamber, a lower inlet air chamber and a narrow neck passage means interconnecting said chambers;

means defining an inlet air passage extending through said block into said inlet air chamber from an inlet air port at a surface portion of said block;

means defining an outlet air passage extending from a portion of said cavity above said inlet chamber through said block to an outlet air port at a surface portion of said block;

and means defining a one-piece combination piston-poppet means movable within said cavity, including a piston portion movable within said piston chamber in sealed engagement with the walls of said chamber and a narrower stem portion extending downwardly from said piston portion into said neck passage and having a maximum diameter less than the diameter of said piston portion;

said stem portion including sealing means operable to close said neck passage means when said piston is in an upper position within said piston chamber;

said stem portion including said sealing means being movable downwardly into said inlet air chamber solely under foot pressure to open said neck passage means upon downward movement of said piston under foot pressure from said upper position and being movable upwardly solely under air pressure acting in opposition to said foot pressure to close said neck passage.

3,855,705

ENDODONTIC OPERATING SYSTEM

Oscar Malmin, 127 E. Wayne Ave., Akron, Ohio 44301

Continuation of Ser. No. 165,923, July 26, 1971, Pat. No. 3,772,791. This application June 11, 1973, Ser. No. 368,513

Int. Cl. A61c *3/00*

U.S. Cl. 32—40 R **14 Claims**

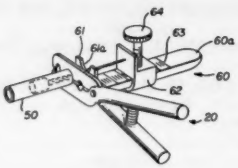
1. An endodontic measurement and operating system for root canal work comprising;

A. an elongate flexible measurement instrument having a handle portion and a shank portion, with said shank portion being adapted to be inserted into said root canal;

B. an elongate, hollow, deformable, cylindrical sleeve having first and second ends telescopically received on and secured to the projecting handle portion of said

instrument by crimping it thereto with said first end thereof abutting the crown of the tooth;

C. forceps means having compression grooves in the jaws thereof for deforming and securing said sleeve to said handle portion of said measurement instrument



1. whereby the distance said shank of said instrument projects from said first end of said sleeve can be determined; and

D. means for measuring the depth of penetration of said measurement instrument.

3,855,706

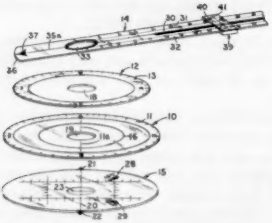
RADIO NAVIGATION PLOTTER

Richard J. Price, 626 N.E. 7th Ave., Boynton Beach, Fla. 33435

Continuation-in-part of Ser. No. 227,975, Feb. 22, 1972, Pat. No. 3,813,783. This application Mar. 15, 1973, Ser. No. 341,711

Int. Cl. G01c *21/20*

U.S. Cl. 33—1 SD **5 Claims**



1. In a radio navigation plotter for an aircraft or watercraft comprising:

a back plate and a front plate concentric with each other, said front plate having a 360° calibrated scale extending circularly about its center, and said back plate having a diametrical North-South line thereon, said back plate being rotatable with respect to said front plate about their common center to displace said North-South line angularly from alignment with the 0–180 axis of said 360° scale on the front plate according to magnetic variation at a particular geographic location;

and an elongated arm pivoted on said plates to turn about their common center, said arm extending laterally beyond one side of the plates and presenting a straight edge which extends radially outward beyond said plates, said arm having a marker aligned with said straight edge and located at the opposite side of the common center of the plates to designate on said scale on the front plate an angle 180° from the angular position of said straight edge;

the improvement which comprises; a disc having a circular compass scale thereon concentric with said scale on the front plate and registering with the latter said disc being rotatable relative to said front plate about said common axis to displace said scale on the disc along said scale on the front plate in accordance with the magnetic heading of the craft; said marker on the arm being registrable with said scale on the disc in accordance with the relative bearing so as to designate on said scale on the front plate the magnetic bearing of the craft to the radio station.

3,855,707

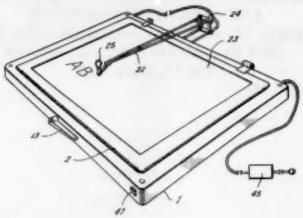
TACTILE DRAWING AND WRITING DEVICE

Donald R. Traylor, 308 Leisure Ln., Victoria, Tex. 77901

Filed Sept. 14, 1972, Ser. No. 289,069

Int. Cl. B43l *13/00*

U.S. Cl. 33—24 C **5 Claims**



1. In a device for forming raised lines, a framework, a workholding means mounted on said framework, a stylus movably mounted on said framework and a vibrator for reciprocating said stylus against a worksheet mounted in said workholding means and a guide positioned opposite said stylus and on the other side of said worksheet for moving said stylus in the desired pattern over the surface of said worksheet and leveling means are mounted in said framework and bear against said workholder to level said workholding means before contacting the worksheet to be held on said framework.

3,855,708

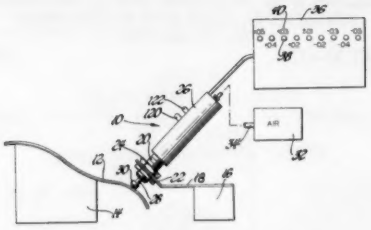
SELF-ACTUATED DIGITAL LOCATION SENSOR

Lewis H. Tann, Troy; Robert J. Carroll, Warren, both of Mich., and Donald L. Lipke, Richardson, Tex., assignors to Candid Logic Inc., Hazel Park, Mich.

Filed Oct. 16, 1972, Ser. No. 298,176

Int. Cl. G01b *7/00*

U.S. Cl. 33—169 R **6 Claims**



1. A probe including: an elongated housing, a rod having one end slidably supported within the housing and the other end projecting from the housing; means for producing a force on said rod so as to cause it to move within said housing; a commutator including a plurality of segments which extend transversely to the direction of motion of the rod; a brush movable on said commutator, one of said commutator and said brush being supported for motion with said rod and the other being fixed relative to said housing; indicator means; and electrical circuitry connected to said transversely extending commutator segments, to said brush, and to said indicator means and operative to cause said indicator means to provide an output which is a function of the position of the rod relative to the housing, said circuitry means including elements con-

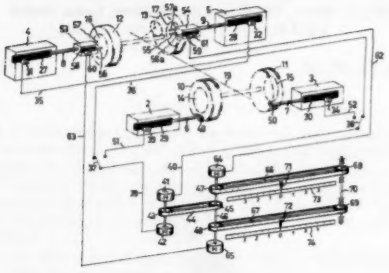
nected between each adjacent pair of commutator segments operative to cause said indicator means to assume a first state when the brush contacts a first segment of said adjacent pair but not the second segment thereof, and a second state when the brush contacts a second segment of the pair, either alone, or in combination with the first segment of the pair, independently of the direction of motion of the brush in reaching such position.

3,855,709

METHOD AND APPARATUS FOR MEASURING CHASSIS GEOMETRY

Georg Hirmann, Zurich, Switzerland, assignor to Polyprodukte, AG, Zurich, Switzerland

Filed Oct. 10, 1972, Ser. No. 296,151
Int. Cl. G01b *5/24*
U.S. Cl. 33—203.15 **24 Claims**



1. Apparatus for measuring the angle of wheel inclination of vehicle wheels comprising:

measuring means for obtaining a measurement of the angle of wheel inclination of each vehicle wheel with respect to a base axis of said apparatus,

correlating means for determining a correction factor corresponding to the relative inclination with respect to said base axis of a predetermined vehicle base axis, and

correcting means for correcting the measurement obtained by said measuring means in accordance with the correction factor determined by said correlating means so as to provide a measurement of wheel inclination with respect to the vehicle base axis, whereby it is unnecessary to align the vehicle in relation to a base axis of the apparatus.

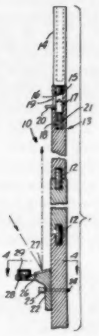
3,855,710

SIGNAL CONTROL DEVICE

Jack Lunden, Sra Box 1541C, Anchorage, Alaska 99507

Filed June 15, 1973, Ser. No. 370,307
Int. Cl. G01c *15/06*
U.S. Cl. 33—295 **8 Claims**

1. A highly portable signal control device for use in surveying sightings, comprising an elongate pole having a bottom end for resting on a survey point, visible projectile firing means on the upper end of said pole for projecting a visible signal device upwardly in axial alignment with said pole, a bracket secured to said pole intermediate of its upper and lower ends and below the eye level of a surveyor holding the pole on a survey point, a level secured on said bracket for vertically aligning said pole, and a sighting mirror secured on said bracket at such angle as to enable a surveyor holding the pole on a survey point to sight along the path of the visible signal device when fired and to compare said path with the upper portion of said pole also visible in said mirror so as to



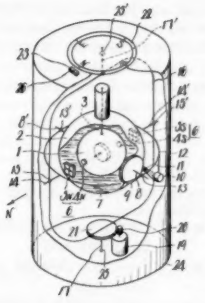
observe deflections of the path of the signal device from the vertical.

3,855,711

GYROCOMPASS

Shin-ichi Kawada, Yokohama, and Takeshi Hojo, Fujisawa, both of Japan, assignors to Kabushikikaisha Tokyo Keiki, Tokyo, Japan

Filed July 31, 1972, Ser. No. 276,785
Claims priority, application Japan, Aug. 10, 1971, 46-60501; Aug. 10, 1971, 46-60504
Int. Cl. G01c *19/38*
U.S. Cl. 33—327 **10 Claims**



1. A gyro compass comprising a gyro case housing therein a gyro with its spin axis being held substantially horizontal, a container surrounding the gyro case and containing a liquid therein, first support means for supporting the gyro case in the container, second support means for supporting the container with three degrees of freedom, and servo means for causing the container to follow up the gyro case about an axis in a direction of gravity, characterized in that the gyro case is adapted so that its weight is greater than the buoyancy applied thereto by the liquid; the center of buoyancy is coincident with its center of gravity; the first support means comprises a flexible suspension member; the suspension member coupling the upper inside of the container with the gyro case so that the latter acts as a pendulum in the container; and the coupling point of the suspension member with the gyro case is positioned higher than the center of gravity of the gyro case, whereby torque proportional to the inclination of the spin axis of the gyro relative to a horizontal plane and also proportional to the residual weight of the gyro case is produced about an

axis perpendicular to a plane including the spin axis of the gyro and a line of gravity therethrough to provide the gyro with a north-seeking action, wherein the second support means comprises a pair of horizontal shafts attached to the container along an axis perpendicular to a plane including the spin axis of the gyro and a line of gravity therethrough, a horizontal gimbal ring having a pair of bearings rotatably supporting the pair of horizontal shafts and a pair of normally horizontal gimbal shafts along an axis substantially perpendicular to the pair of bearings, the horizontal ring being disposed outside of the container, a follow-up ring having a pair of bearings rotatably supporting the pair of gimbal shafts and a pair of follow-up shafts along an axis substantially perpendicular to the pair of gimbal shaft bearings and normally in the vertical direction, the follow-up ring being disposed outside of the horizontal ring, and a binnacle having a pair of bearings rotatably supporting the pair of follow-up shafts.

3,855,712
METHOD OF PREPARATION OF PHARMACEUTICAL PRODUCTS

Pierre Blonde, Saint Maur Des Fosses, France, assignor to Societe Anonyme dite: Orsymonde, Paris, France

Filed Apr. 2, 1974, Ser. No. 457,244

Claims priority, application Great Britain, Apr. 3, 1973, 15914/73

Int. Cl. F26b *5/06*

U.S. Cl. 34—5 **17 Claims**

1. A process of preparation of a dehydrated or desolvated pharmaceutical product by lyophilisation, which comprises the steps of:

i. combining with a pharmaceutical composition to be lyophilised

a. a polymeric binder selected from the group consisting of polymeric compounds which are soluble in water and polymeric compounds capable of giving colloidal solutions in water; and

b. an organic solvent for the binder having a speed of evaporation less than 50 times that of ether;

ii. solidifying the paste so obtained at a temperature in the range of −15° to −50°C; and

iii. subjecting the resultant frozen material to a process of lyophilisation under vacuum.

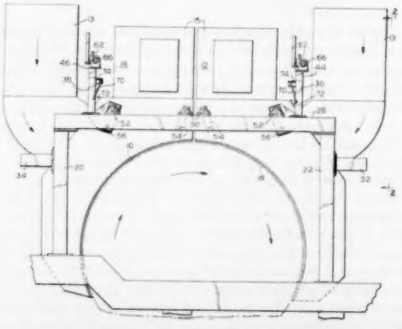
3,855,713
HOOD FOR DRYER

Robert C. Portouw, Portland, Oreg., assignor to Drew Engineering Co., Portland, Oreg.

Filed Mar. 2, 1971, Ser. No. 120,258

Int. Cl. F26b *11/02*

U.S. Cl. 34—122 **3 Claims**



1. A dryer apparatus for removing moisture from material carried upon a rotating cylinder comprising:

a hood extending the length of said cylinder adjacent a portion of the periphery thereof;

frame means for supporting said hood;

means supporting said hood from said frame means for movement toward and away from said cylinder;

centering means connected to said frame means and to said hood at the longitudinal center thereof for restraining the center of said hood from movement longitudinally of said cylinder and permitting movement of said hood toward and away from said cylinder;

said centering means comprises a rod connected to each of said frame means and to said hood at the longitudinal center thereof and restraining the center of said hood from movement longitudinally of said cylinder; and

said rod means being pivotable with respect to said frame means and said hood about laterally spaced parallel axes.

3,855,714
INSTRUCTIONAL DEVICE AND METHOD FOR STUDYING THE GROSS ANATOMY OF THE HUMAN OR ANIMAL ORGAN SYSTEMS

Bartley C. Block, 233 Plains Rd., Milford, Conn. 06460

Filed Mar. 5, 1973, Ser. No. 338,084

Int. Cl. G09b *23/34*

U.S. Cl. 35—17 **2 Claims**

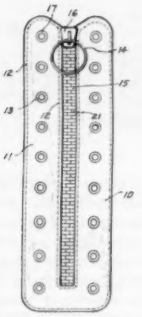
1. An instructional device for studying the gross anatomy of the human or animal organ systems and organs comprising a two-dimensional manikin having anterior and posterior views of an opaque skeleton printed back to back on a transparent glossy backing and surrounded by an appropriate body outline, and a plurality of individually cut and individually applied illustrative organs of the organ systems constituted of vinyl plastic, each of said organs having selected, semi-transparent colors and transparent areas thereon, said colors indicating certain properties of said organs, the latter being adapted to adhere to the manikin upon the application of pressure thereto after each is accurately positioned on the manikin, said semi-transparent colors and transparent areas on each organ applied to said manikin permitting the visualization of the underlying bones and all attachment points thereon by the student of anatomical study of both the anterior and posterior views of the skeleton.

3,855,715

BOOT ZIPPER

William Peter Johnson, Burnaby, British Columbia, Canada, assignor to The Raymond Lee Organization Inc., New York, N.Y., a part interest

Filed Oct. 5, 1973, Ser. No. 404,099
Int. Cl. A43b *11/00*; A44b *19/30*
U.S. Cl. 36—50 1 Claim



1. A replaceable zipper unit adaptable for ready installation on or removal from a boot which is formed of a split sheet of material, the adjoining split edges of which are fastened to a conventional zipper mechanism, said unit being perforated along its length with holes on each side of the zipper mechanism and fastened to a boot by means of loops of elastic lacing, in which

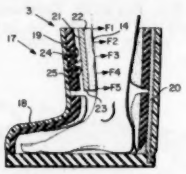
a split ring is fastened to the zipper slide so that the zipper slide may be latched in position by fastening the split ring through a loop of lacing adjacent the position of the zipper slide.

3,855,716

SKI BOOT LOAD DISTRIBUTOR FOR LOWER LEG

Harold D. Hutchinson, 26734 W. Latigo Shore Dr., Malibu, Calif. 902265

Filed Feb. 21, 1974, Ser. No. 444,461
Int. Cl. A43b
U.S. Cl. 36—2.5 AL 4 Claims



1. In combination:

a. a ski boot including a foot portion and rigid cylindrical leg portion;

b. a vertically elongated rigid member transversely curved and tapering in width in a downward direction to conform to the front of a person's shin and thereby engage the same over a substantial surface area; and

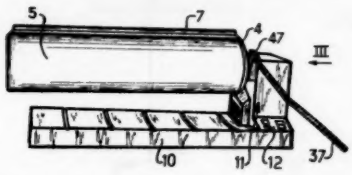
c. bearing means between the front portion of said member intermediate its upper and lower ends, and an inside portion of said rigid cylindrical leg portion, said bearing means defining a fulcrum about which tilting of said member can take place whereby forces concentrated at said fulcrum resulting from a leaning forward of a person's leg in the boot are distributed by said member over said surface area.

3,855,717

SMALL-SIZED LINEN IRONING MACHINE

Maurice Marie Achille Trouilhet, Lyon, France, assignor to SEB S.A., Selongey, France

Filed Mar. 12, 1974, Ser. No. 450,429
Claims priority, application France, Mar. 20, 1973, 73.09988
Int. Cl. D06f *63/00*, *65/04*
U.S. Cl. 38—60 9 Claims



1. In an ironing machine comprising a casing; an ironing drum; a shoe adapted to co-operate with said drum for ironing linen disposed thereon; means contained in said casing for driving said drum in rotation; bar means mounted on said casing and extending therefrom in parallel relationship to one another; said bar means including a tubular bar onto which said drum is rotatively mounted, a tube section onto which said shoe is rotatively mounted for co-operation with said drum, and two tubes forming a base for the machine, the improvements wherein said casing includes a projecting portion forming a double sleeve namely a first sleeve receiving said tubular bar and a second sleeve containing a toothed wheel member meshing with teeth provided at the internal periphery of said drum; said toothed wheel member including a hollow and internally splined portion serving as a housing for a cylindrical member, said cylindrical member being provided with slots co-operating with said splined portion for driving said toothed wheel member in rotation; and said casing further containing speed reducer means including a gear wheel train driven by said motor for rotating said drum via said cylindrical member and said toothed wheel member, said cylindrical member and said toothed wheel member as well as said gear wheel train being disposed along an axis which is substantially parallel to the axis of revolution of said drum.

3,855,718

ADJUSTABLE MOUNTING FOR WORK-OBJECTS AND THE LIKE

Carolyn J. Parsons, and Stoner Parsons, both of 130 Echo Dr., Paris, Ky. 40361

Filed Nov. 30, 1973, Ser. No. 420,457
Int. Cl. D05c *1/04*
U.S. Cl. 38—102.2 4 Claims

1. A freely adjustable supporting assembly comprising

a. a spherical element

b. a pair of substantially flat and contacting plates adapted to receive said spherical element therebetween;

c. said plates being held together and attached to a support;

d. one of said substantially flat plates having a round recess to receive a portion of said spherical element;

e. the other of said plates having a round aperture of larger diameter than that of the aforementioned round recess and a smaller diameter than that of said spherical element;

f. a portion of said spherical element being adapted to extend through said round aperture;

g. a screw-threaded shank connected to the last-mentioned portion of said spherical element;

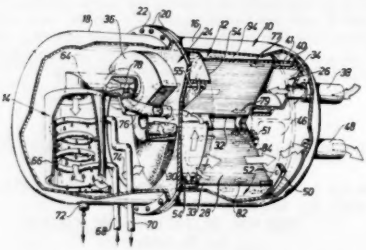
h. a nut screw-threadedly engaging said shank;
i. a brace secured to said screw-threaded shank by said nut;

and
j. a work-supporting member carried by said brace.

3,855,719
METHOD AND A DEVICE IN CONNECTION WITH A REGENERATIVE DRIER FOR GAS UNDER OVERPRESSURE

Uno I. Jonsson, Spanga, Sweden, assignor to AB Carl Munters, Sollentuna, Sweden

Filed Mar. 5, 1973, Ser. No. 337,892
Claims priority, application Sweden, Mar. 10, 1972, 3120/72
Int. Cl. F26b *3/00*
U.S. Cl. 34—9 **8 Claims**



1. A method of using a regenerative drier for treating a hot gas compressed in a compressor unit, comprising,
rotatably mounting a rotor in a housing, said rotor being composed of a substance with hygroscopic properties, and having therethrough a plurality of axially extending channels,
dividing the space occupied by said rotor into a drying zone and a regenerating zone, each of which zones includes a different group of said channels in said rotor, and
causing substantially all the hot gas coming from the compressor first to pass axially through the rotor channels in said regenerating zone to remove moisture therefrom, and then to be cooled and predried in a condenser before passing through the rotor channels in said drying zone for final drying.

3,855,720
AUTOMATIC LINE RELEASE FOR SPIN FISHING EQUIPMENT

Thor Dorph, 120 Ellis St., Apt. 101, San Francisco, Calif. 94102

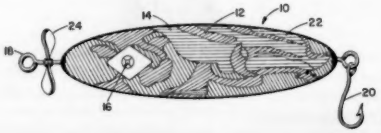
Filed Dec. 26, 1972, Ser. No. 318,272
Int. Cl. A01k *87/00*
U.S. Cl. 43—25 **4 Claims**

1. In combination with a spinning rod and reel, an automatic line release device comprising:
a housing firmly attached to the handle of said rod on the opposite side of and forwardly of said reel;
a trigger mounted in said housing to pivot from a first position within said housing to a second position extending outwardly of said housing and having a line receiving notch in that side of said trigger which faces the butt of said rod when in said second position so that line between said reel and the first guide on said rod may be placed in said notch;
cam means mounted in said housing for holding said trigger in said second position prior to making a cast; and
means connected to and responsive to bending of said rod during casting for disabling said cam means but blocking movement of said trigger until said rod approaches a straight position to permit said trigger to move to said first position to release the line automatically at the proper moment.

3,855,721
FISHING LURE

James W. Strader, P.O. Box 4029, Tallahassee, Fla. 32303

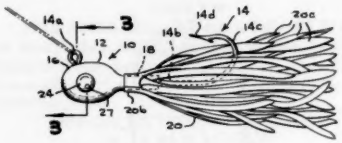
Filed Aug. 17, 1972, Ser. No. 281,301
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.32 **3 Claims**



1. An artificial fishing lure for attracting fish comprising:
a body portion,
hooking means attached to said body portion,
said body portion having a first surface portion that reflects electromagnetic energy of a first frequency,
said body portion having a second portion that reflects electromagnetic energy of a second different frequency, said first and said second body exterior portion randomly disposed adjacent each other about the outer surface of said body providing a plurality of randomly disposed swirl

patterns relative to the longitudinal and to the peripheral axes of said plug.

3,855,722
FISHING LURE CONSTRUCTION
James E. Moore, Rt. 3, Tullahoma, Tenn. 37388
Filed June 6, 1973, Ser. No. 367,439
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.34 **8 Claims**

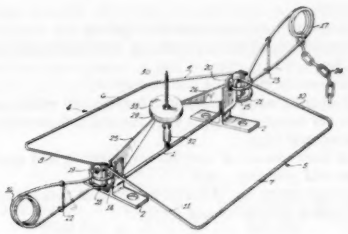


1. An artificial fishing lure adapted to be drawn through water by a fishing line, comprising a main lure body having a generally rounded leading head portion, a fish hook coupled to said lure body, said lure body being a molded metal body molded about the shank portion of the fish hook, a pair of eye assemblies mounted on the head portion for producing a moving eye appearance responsive to inertial and impact forces during movement of the lure through the water; each eye assembly comprising a hollow shell including a circular backing member having an outwardly facing generally flat planar surface of a selected color resembling the sclera portion of an eye, a transparent generally domeshaped lens member having an uninterrupted concave inner surface and joined peripherally to and curving outwardly from the backing member to define an uninterrupted enclosed space therebetween, and a spherical ball of a color contrasting to that of said backing member and freely disposed in said enclosed space, said ball being of smaller diameter than the maximum spacing between the outermost portion of said lens member and backing member to freely roll about in said enclosed space and thereby produce a moving eye appearance responsive to said inertial and impact forces on the lure when drawn through the water.

3,855,723
FISHING APPARATUS AND QUICK CONNECTORS THEREFOR
Melbourne D. Mc Gahee, Melbourne, Fla., assignor to Loop A Line, Inc., Melbourne, Fla.
Filed Dec. 26, 1973, Ser. No. 428,479
Int. Cl. A01k *91/04*
U.S. Cl. 43—44.83 **18 Claims**

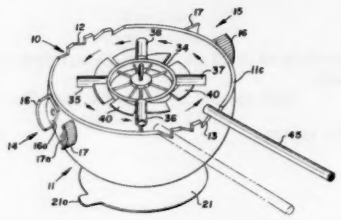
1. Fishing apparatus comprising a special connector, said special connector including an oval horizontal eye member having a pair of long sides and a pair of short sides, a pair of upstanding side members joined to said pair of short sides of said oval horizontal eye member and having their ends joined together, an extension of one of said upstanding side members continuing beyond the opposite side of one of said oval eye side members, a bend in said extension, a central shaft connected to said bend having an end and passing back centrally through said oval eye member, and first and second fishing implements connected to said joined ends of said upstanding side members and to said shaft and disposed in said bend.

3,855,724
ANIMAL TRAP
Michael Benz, 68 3rd Ave., Williams Lake, British Columbia, Canada
Filed Apr. 26, 1974, Ser. No. 464,598
Int. Cl. A01m *23/26*
U.S. Cl. 43—92 **6 Claims**



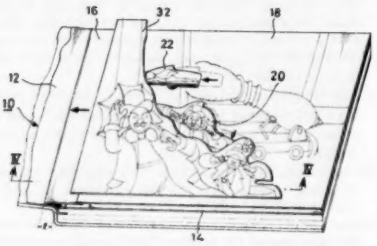
1. An animal trap comprising:
a base;
a pair of frames, each having an elongated side member and a pair of spaced end members, pivotally mounted on said base about a common axis such that said frames can rotate between an open position in which said side members are widely separated from each other and a closed position in which said side members are closely adjacent to each other;
a ring member encircling each pair of adjacent end members and adapted to slide freely along each pair of said adjacent end members between said base and said side members;
spring means adapted to urge said ring members towards said side members as said frames move to said closed position;
trigger means adapted to maintain said frames in said open position against the action of said spring means and to be triggered to release the trap to said closed position, said trigger means comprising first and second trigger members pivotally mounted on said base and each adapted to releasably retain a said ring member adjacent said base when said trap is in said open position;
a hollow disc member rigidly secured to said first trigger member remote from said pivotal mounting thereof and adapted to slidably contact said second trigger member; and
bait holding means pivotally secured to said base intermediate said pairs of end members extending through said hollow disc member and including a plate member rigidly secured thereto, said plate member being adapted to engage and depress said hollow disc member and said trigger members upon movement of said bait holding means thereby releasing said ring members and causing said trap to close.

3,855,725
SPINNING TOY
James T. Tollefson, 2900 Dicken Ln., Mound, Minn. 55364
Filed Sept. 17, 1973, Ser. No. 398,013
Int. Cl. A63h *33/00*
U.S. Cl. 46—1 C 7 Claims



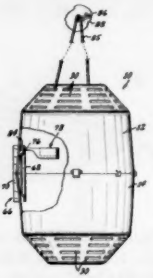
1. A spinning toy or the like, including:
a. a bowl shaped container having a generally circular upper edge;
b. means for mounting said container;
c. a spinner member mounted for rotation within said container below said upper edge thereof and generally planar with said edge;
d. at least one set of notches arranged on said upper edge of said container; and,
e. an actuating rod movable across said notches to impart rotative motion to said spinner.

3,855,726
STEREOGRAPHIC PICTURE BOOK
Hirokazu Yumoto, No. 1-11, 2-Chome, Sumida, Sumida-ku, Tokyo, Japan
Filed June 14, 1973, Ser. No. 369,923
Claims priority, application Japan, June 19, 1972, 47-72302
Int. Cl. A63h *33/00*
U.S. Cl. 46—34 1 Claim



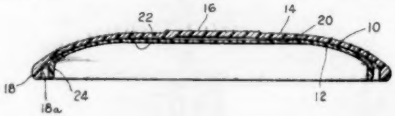
1. A stereographic picture book which comprises a folded base plate including left and right side plates, an operating plate dimensioned for connection at one end thereof to an inner edge of the left side plate and for extension over the right side plate, a stationary plate fixed to said right plate for movement relative to the operating plate, at least one display movably arranged on the second plate, a swivel connection interconnecting the operating plate with the display through an opening provided in said stationary plate for effecting movement of the display, a projectable picture plate connected by a flexible connection, at its one end, to said stationary plate and for projection, at its opposite end, to the operating plate, said flexible connection interconnecting the operating plate with the projectable plate through a second opening provided in the stationary plate for effecting protrusion of the projectable plate from the plane of the stationary plate.

3,855,727
FLY TRAP APPARATUS
Grant Canoy, 3221 Third Ave., Great Falls, Mont. 59401
Filed July 27, 1972, Ser. No. 275,471
Int. Cl. A01m *1/02*
U.S. Cl. 43—65 3 Claims



1. A trap for attracting and retaining flies comprising:
a first hollow member having a first end portion including a funnel shaped opening for the passage of flies into said trap and a plurality of apertures too small for the passage of flies, and a second end portion including a large opening, a guide arm, and connecting means including an attachment arm and an attachment bead;
a second member structurally identical to said first member, said attachment arm of said first member being engagable with the attachment bead of said second member, and the attachment arm of said second member being engagable with said attachment bead of said first member, whereby said first and second members are engagable along the second end portions of said members, said second end portions of said first and second members having means including slots for attaching a bait tray element thereto;
a bait tray element having engaging means removably receivable by said slots of said first and second member, said bait tray element including a bait supporting dish and a trap supporting base, said bait supporting dish being positioned within said first and second members, and said supporting base being positioned outside when said members are engaged and said engaging means is in said slots.

3,855,728
AERODYNAMIC TOY
William B. Hynds, 3634 Fox Hall Rd., Columbia, S.C. 29204
Filed Jan. 10, 1974, Ser. No. 432,285
Int. Cl. A63h *27/00*
U.S. Cl. 46—74 D 4 Claims



1. An aerodynamic toy comprising:
a first disk having a circular substantially flat main body portion, said main body having an upper surface and a lower surface, a rim circumscribing said main body portion extending vertically downwardly therefrom;
a second disk removably received within said first disk having a circular main body portion of a smaller diameter than said first disk, said main body of said second disk having an upper surface and a lower surface;
a rim circumscribing said main body portion of said second disk and extending downwardly therefrom;

a bottom edge of said rim of said second disk terminating on substantially the same horizontal plane as a bottom edge of said rim of said first disk when said second disk is nested within said first disk with an upper surface of said main body of said second disk flush against a lower surface of said first disk;

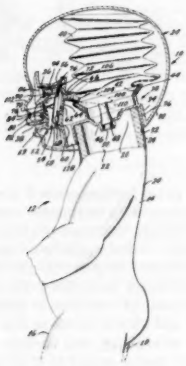
whereby said disks can be thrown together for separating in flight.

3,855,729

ANIMATION DEVICE FOR A FIGURE TOY

Jurgis Sapkus, Manhattan Beach; J. Stephen Lewis, Pacific Palisades; Colin Vowles, Santa Monica, and William R. Yarbrough, Cerritos, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Oct. 23, 1973, Ser. No. 408,715
Int. Cl. A63h *3/24, 5/00*
U.S. Cl. 46—116 **6 Claims**



1. In combination with a figure toy having a hollow head and a torso, said torso defining a water-impervious, compressible air chamber and having a neck opening, animating means comprising:

air pump means connecting said head to said neck opening in water-tight relationship with said torso;

first conduit means placing said air pump means in fluid communication with said torso;

a water reservoir mounted in said figure toy;

air-inflatable pressurizing means mounted in said reservoir for pressurizing water stored therein; and

second conduit means connecting said pressurizing means to said air pump means for supplying compressed air thereto, whereby said reservoir may be pressurized by compressing said torso.

3,855,730

FLAT STUFFED DOLL AND CLOTHING COMBINATION

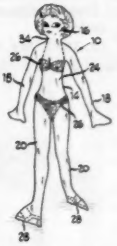
Marcy L. Baer, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Aug. 3, 1973, Ser. No. 385,461
Int. Cl. A63h *3/02*
U.S. Cl. 46—158 **1 Claim**

1. A flat stuffed doll and clothing combination comprising:

a three-dimensional doll body including a generally flat torso made from soft material enclosed by a fabric cover, the torso being dimensioned so as to have a relatively substantial height and width but relatively small depth giving the appearance of a two-dimensional figure;

generally flat arms and legs connected to said torso and made from soft stuffing material enclosed by a fabric cover with the arms and legs having height and width but relatively small depth, said legs having feet formed at the bottom thereof extending laterally outwardly of the legs at a width greater than the remainder of the leg, said legs



being movable with respect to said torso in a front-to-rear direction and having sufficient rigidity so that the doll is self-supporting in a standing position on said feet when said legs are spaced in said front-to-rear direction from each other; and

substantially flat clothes adapted to fit on said body and enclose said torso.

3,855,731

THROW MATS

Richard H. Yerkes, 3021 Unruh St., Philadelphia, Pa. 19149

Filed Oct. 2, 1973, Ser. No. 402,832
Int. Cl. E06b *7/00*
U.S. Cl. 49—70 **5 Claims**

1. In a building structure including a floor, a doorway frame, and a door hinged to the frame for swinging movement between closed and open positions, mechanism to be used by a pedestrian opening the door to wipe or scrape shoes or other foot-covering comprising:

a mat formed in the shape of a segment, one edge of the mat being fixed to the floor adjacent the bottom of the door, the mat being adapted to occupy a lay-down position when door is open wherein the mat extends on the floor in front of the door and thereby available for contact by the foot-covering of a pedestrian and also adapted to occupy a retracted position when the door is closed whereby the mat is held closely adjacent the door and generally parallel the plane of the door and thereby unavailable for foot-covering contact;

first drive means on the door including a roller engaging said mat operative as a function of door motion in a direction from the closed to the open position to exert a force on the mat and pull the same from the retracted position to the lay-down position, said drive means being operative to develop said force only when the door is in motion in said direction; and

second drive means including gear means on the floor and gear means on the door meshing therewith operative as a function of door motion in a direction from open to closed position to exert a force on the mat to pull the same from the lay-down to the retracted position, the

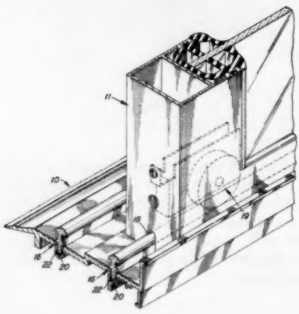
second drive means being operative to develop said force only when the door is in motion in last said direction.

3,855,732

THRESHOLD STRIP FOR SLIDING DOORS HAVING REPLACEABLE BEARING TRACK

James E. Sheaf, Obetz, Ohio, assignor to Rollyson Aluminum Products, Sheridan, Ohio

Filed Oct. 15, 1973, Ser. No. 406,142
Int. Cl. E05d *13/02*
U.S. Cl. 49—425 **4 Claims**



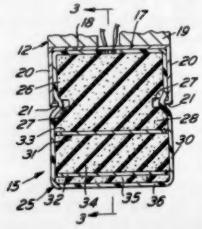
1. A threshold strip for supporting a sliding door comprising a longitudinally extending body with side edges having a longitudinally extending upwardly-opening track-receiving groove formed therein intermediate the side edges, a track removably mounted on said body, a longitudinally extending depending tongue on said track so shaped relative to the groove that it can be slipped downwardly into the groove to be retained therein by friction or be withdrawn upwardly out of the groove for removal, a longitudinally extending support portion on said track above said tongue with a longitudinally extending bearing surface at its upper edge, in which the groove is of substantially U-form in transverse cross-section and the depending tongue is of cooperating similar cross-section so that it can be slipped downwardly into the groove or be pulled upwardly therefrom, and including longitudinally extending support flanges on the track at a level between the depending tongue and the support portion and extending laterally outwardly in opposite directions to provide support surfaces which rest on the strip body at opposite sides of the groove therein.

3,855,733

SENSITIVE EDGE FOR A DOOR

Norman K. Miller, Concordville, Pa., assignor to Miller Brothers, Concordville, Pa.

Filed June 27, 1973, Ser. No. 374,040
Int. Cl. E06b *7/23*
U.S. Cl. 49—488 **3 Claims**



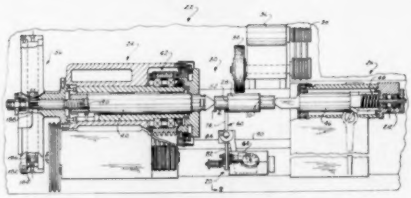
1. An electrically pressure sensitive edge structure adapted for a door, said structure comprising a channel extending along a door facing outwardly therefrom, internal projections in said channel, and an entirely resiliently compressible pressure sensitive assembly of foam material snugly engaged longitudinally in said channel, said assembly including a base portion substantially completely occupying said channel, said base portion being sufficiently laterally compressible for edgewise engagement into and withdrawal from said channel past said internal projections, and an active portion extending outwardly from said channel, said assembly being formed with recesses releasably receiving said projections.

3,855,734

GRINDING MACHINE WITH WORKPIECE LOCATOR ASSEMBLY

Roger H. Fournier, Millbury, Mass., assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Mar. 28, 1973, Ser. No. 345,693
Int. Cl. B24b *49/00*
U.S. Cl. 51—165 R **18 Claims**



8. An apparatus as set forth in claim **7** wherein said motor means is reversible to enable said motor means to move said probe member in opposite directions relative to the work area, said connection means including first and second springs and means for connecting said springs with said motor means to enable said motor means to move said probe member in a first direction from said inactive condition to said active condition upon operation of said motor means in one of said opposite directions and for connecting said springs with said motor means to enable said motor means to move said probe member in a second direction from said inactive condition to said active condition upon operation of said motor in the direction opposite to said one direction, and control means for effecting operation of said motor means in said one direction to move said probe member in said first direction from said inactive condition to said active condition and for effecting operation of said motor means in said direction opposite to said one direction to move said probe member in said second direction from said inactive condition to said active condition.

3,855,735

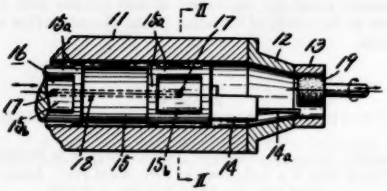
DIMENSIONAL CONTROL GAUGE FOR INTERNAL GRINDERS

Hiromiti Tateisi, and Mituo Tamura, both of Iwata, Japan, assignors to Tokyo Bearing Manufacturing Company Limited, Osaka-shi, Japan

Continuation of Ser. No. 140,366, May 5, 1971, abandoned. This application Aug. 13, 1973, Ser. No. 387,660
Claims priority, application Japan, Dec. 18, 1970, 45-114385
Int. Cl. B24b *49/04*
U.S. Cl. 51—165 R **2 Claims**

1. Apparatus for supporting a gauge for dimensional control in internal grinders comprising a rotatable hollow chuck spindle having a backing plate at the front end thereof for receiving a workpiece to be internally ground by a rotatable grinding wheel opposed to the chuck spindle and axially reciprocable into and out of the workpiece, a gauge head supporting shaft mounted within said chuck spindle, a gauge head having measuring means mounted on the front end of said supporting shaft, said measuring means including a single feeler adapted to be in contact with the inner surface of the workpiece during machining operation to measure the radius thereof, axially

spaced hydrostatic bearing means mounted within said chuck spindle and supporting said supporting shaft for axial movement coaxially within said chuck spindle whereby during a machining operation the measuring means of said gauge head will be maintained in contact with the inner surface of the workpiece being ground, said hydrostatic bearing means including a plurality of recessed chambers having an oil hole provided at the central portion of each of said recessed chambers, said oil holes being in communication with the center portion of said supporting shaft, the rotatable grinding wheel being in contact with the internal upper half surface of the workpiece being ground while said gauge head is in contact with the internal lower half surface of said workpiece.

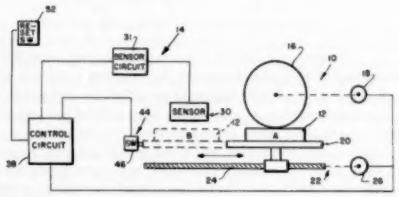


3,855,736

GAGING METHOD AND APPARATUS

Wallace M. Porter, Jr., Redondo Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Jan. 3, 1972, Ser. No. 214,920
Int. Cl. B24b *1/00, 49/04, 49/06*
U.S. Cl. 51—165.75 **6 Claims**



1. The method of gaging a selected dimension of an article comprising the steps of:

selecting an electrical gaging sensor which produces a continuous output signal that assumes a true gaging signal level representing the true value of said article dimension when said sensor and article are located in gaging position relative to one another and varies from said true signal level through a range of signal levels corresponding to other values of said article dimension in response to relative movement of said sensor and article from said gaging position;

effecting relative movement of said article and sensor in a manner such that the relative movement of said article with respect to said sensor occurs through said gaging position;

producing a gaging position signal in addition to and totally distinct from said sensor output signal when said article is located in gaging position; and

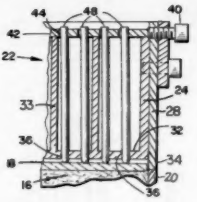
monitoring the output of said sensor only during occurrence of said gaging position signal.

3,855,737

AUTOMATICALLY ADJUSTABLE BLOCKING DEVICE

James A. Clark, Mendon, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Nov. 20, 1972, Ser. No. 308,210
Int. Cl. B24b *14/06;* **B23g** *3/00*
U.S. Cl. 51—216 R **13 Claims**



1. Apparatus for supporting an object to be worked on, said object having at least two surfaces, each of said surfaces having a free undistorted contour, said apparatus comprising:

a. housing means, said housing means including first and second relatively movable portions, said first portion being provided with a plurality of through holes, said second portion being provided with a plurality of apertures in a pattern corresponding to said hole pattern provided in said first portion;

b. surface engagement means in the form of a plurality of automatically and simultaneously movable pins, each of said pins having a longitudinal axis, said pins being received in said holes and said apertures and movable in a direction substantially parallel to said axes; and

c. means, provided on said housing means, for moving said second part relative to said first part to substantially simultaneously lock all of said pins against axial movement.

3,855,738

CRYSTAL INDEXING FIXTURE

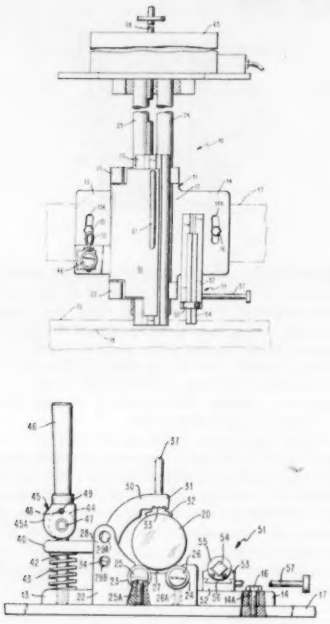
Robert Clifton Guggenheim Sr., Poughkeepsie, and Frank Victor Liucci, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 9, 1972, Ser. No. 305,018
Int. Cl. B24b *41/06;* **B25b** *1/08, 5/04*
U.S. Cl. 51—217 R **15 Claims**

2. A crystal boule indexing fixture, said fixture comprising: a frame including a pair of spaced apart, axially extending bores having parallel axes; a pair of rods extending through said bores, a cover hingedly connected to said frame and movable between a first position overlying a portion of said rods to press a crystal boule against said rods and a second position to increase the spacing of said cover from said rods; said frame including a body portion and projecting flanges, and means defining arcuate slots in each of said flanges to permit adjustment of said body portion in a vertical plane; a lever projecting from said cover and means biasing said lever to maintain said cover in said first position; and anti-torque means on said cover to mate with means on a crystal boule to inhibit rotation thereof, and means to engage said lever to over-ride said biasing means to lift said cover into said second position.

4. A crystal boule indexing fixture, said fixture comprising: a frame including a pair of spaced apart, axially extending bores having parallel axes; a pair of rods extending through said bores, a cover hingedly connected to said frame and movable between a first position overlying a portion of said rods to press a crystal boule against said rods and a second position to increase the spacing of said cover from said rods; a lever projecting from said cover and means biasing said lever to maintain said cover in said first position; and anti-torque

means on said cover to mate with means on a crystal boule to inhibit rotation thereof, and means to engage said lever to over-ride said biasing means to lift said cover into said second



position, and including drive means; and means for coupling said drive means to a crystal boule held intermediate said cover and rods to displace said boule in a direction parallel to said rods and therealong.

3,855,739

DEVICE FOR GRINDING CURVED SURFACES

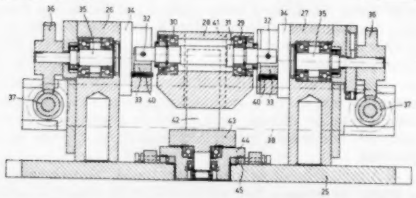
Johannes Anne Van Der Meer, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 3, 1972, Ser. No. 303,391

Claims priority, application Netherlands, Nov. 10, 1971, 7115421

Int. Cl. B24b *9/02*

U.S. Cl. 51—234 **3 Claims**



1. A device for use with a grinding machine of the type having a rotatably mounted grinding wheel and a clamping table movable relative to each other in three mutually perpendicular directions, for grinding curved surfaces, said device comprising a frame to be secured to said clamping table, a workpiece table movably mounted in said frame for supporting a workpiece to be ground, two eccentric couplings each rotatably journalled at one end thereof in said workpiece table and at the other end thereof in said frame for supporting said workpiece table in said frame for movement therein, means for separately adjusting the degree of eccentricity of each of said couplings for varying the radius of curvature of the curved surface to be machined, and means for causing rotational movement of said eccentrics so that a point on said workpiece and said workpiece table will describe a circular path in a plane at right angles to the axis of rotation of said eccentric couplings, the radius of said circular path being equal to the radius of curvature of the curved surface to be ground.

3,855,740

CENTRIFUGAL BARREL FINISHING APPARATUS HAVING TILTABLE TUBS

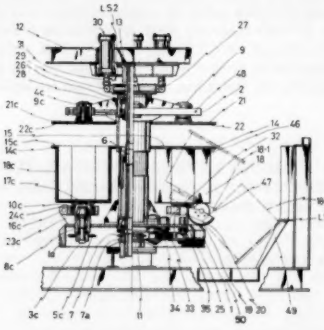
Hisamine Kobayashi, Nagoya, Japan, assignor to Shikishima Tipton Mfg. Co. Ltd., Nagoya City, Aichi Pref., Japan

Filed Feb. 14, 1973, Ser. No. 332,378

Claims priority, application Japan, Feb. 19, 1972, 47-17340

Int. Cl. B24b *31/04*

U.S. Cl. 51—164 **12 Claims**



1. A centrifugal barrel finishing apparatus comprising a lower turret rotatably mounted for rotation around a central axis, a plurality of tubs rotatably mounted on said lower turret around said central axis and rotatable around axes parallel to said central axis, drive means coupled to said lower turret for rotating said lower turret, tub drive means detachable coupled to said tubs for rotating said tubs, said tubs being pivotally mounted on said lower turret for pivotal movement outwardly of said central axis to a position in which the axes of the tubs are at more than 90° to the central axis, tub-pivoting means coupled to said tubs, an upper turret mounted above said lower turret and movable toward and away from said lower turret, tub covers on said upper turret in positions corresponding to the positions of said tubs on said lower turret and engageable with said tubs to close said tubs when said upper turret is moved toward said lower turret, and upper turret drive means coupled to said upper turret for moving said upper turret toward and away from said lower turret.

3,855,741

CLOSURE FOR FIRE RESISTANT STRUCTURE

Howard W. Semon, Malvern, Pa., assignor to General Electric Company, Fairfield, Conn.

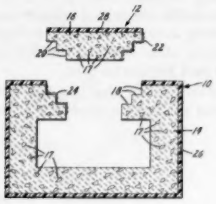
Filed Apr. 12, 1973, Ser. No. 350,537

Int. Cl. E04b *1/94*

U.S. Cl. 52—19 **2 Claims**

1. In a high-temperature-resistant container having an opening into its interior which opening is closable by a cover which when closed forms an interface between surfaces of the con-

tainer and of the cover, the improvement comprising a facing affixed to a surface at the interface, which facing is a cloth of



fibers of a glass hard at normal ambient temperature and having a softening point below the said high temperature.

3,855,742

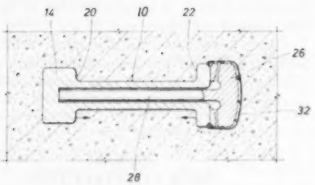
APPARATUS FOR PRESTRESSING A STRUCTURAL MEMBER

John D. Jeter, Midland, Tex., assignor to Texas Dynamatics, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 57,729, July 23, 1970, abandoned. This application Apr. 26, 1972, Ser. No. 247,783

Int. Cl. E04c *2/08*

U.S. Cl. 52—98 **8 Claims**



1. A reinforcing device for embedding in a body of hardenable material to place a portion of the material in compression after it has hardened, said device comprising a first member having opposing, spaced surfaces between which a portion of the hardenable material is located when the device is embedded therein, and a second member arranged to hold tensile stress in the first member to strain the member and move the two opposed surfaces thereof apart, said second member being of a shape and of a material that it will fail after the material in which it is embedded has hardened thereby releasing the first member to allow at least a portion of the stress in the first member to place the portion of the hardened material between the opposing surfaces of the first member in compression.

3,855,743

BUILDING CONSTRUCTION

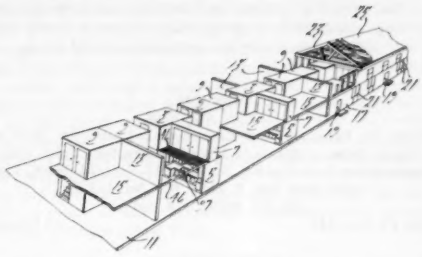
Albert L. Wokas, 22245 Thorofare, Grosse Ile, Mich. 48138

Continuation of Ser. No. 80,891, Oct. 15, 1970, abandoned. This application Sept. 11, 1972, Ser. No. 287,883

Int. Cl. E04b *1/348*

U.S. Cl. 52—79 **4 Claims**

1. A two story townhouse construction comprising a foundation, a first box positioned on the foundation and containing a stairway from the first level to the second level, a second box on the foundation containing a pair of back-to-back utility rooms and having a height substantially the same as that of the first level, a third box on the foundation containing a pair of back-to-back kitchen sections and having a height substantially the same as that of the first level, a fourth box supported on the second box and containing a pair of back-to-back bathrooms and having a height substantially the same as the second level, said second, third, and fourth boxes containing vertical transverse central walls extending the full heights of the boxes and being hollow and containing utility service means and separating one room or section from the other, said



boxes being arranged so that said hollow central walls are substantially coplanar and communicable with each other and with the wall separating adjacent apartments of the townhouse, and walls, ceilings, floors, and roof extending from and around said boxes and being separate therefrom.

3,855,744

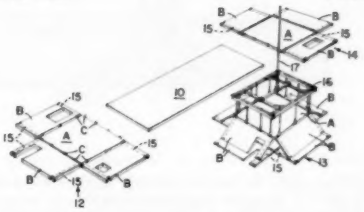
MODULE FOR BUILDING CONSTRUCTION

Oleg V. Miram, 759 Flood Bldg., San Rafael, Calif. 94102

Division of Ser. No. 134,623, April 16, 1971, Pat. No. 3,724,157. This application Aug. 21, 1972, Ser. No. 282,400

Int. Cl. E0b *1/35*

U.S. Cl. 52—126 **5 Claims**



1. A module for use in constructing a building comprising:

a. an overhead panel having a plurality of edges and means embedded therein having no portion extending beyond the boundaries thereof for distributing the weight thereof to a plurality of locations spaced from each other along the edges thereof, said means including a metallic coil at each of said locations having its axis perpendicular to the edge of said panel associated therewith one end of said coil adjacent said edge;

b. a wall panel having a plurality of edges and means embedded therein having no portion extending beyond the boundaries thereof for distributing the weight thereof to a plurality of locations spaced from each other along one of said plurality of edges thereof, said means including a metallic coil at each of said locations having its axis perpendicular to said one edge and with one end of said coil adjacent said one edge; and

c. removable hinge joinder means including a lifting eye for attachment to a lifting means attached to said overhead panel at each of said plurality of locations spaced from each other along said plurality of edges of said overhead panel, said hinge joinder means along one of said plurality of edges of said overhead panel interconnecting said plurality of locations along said one edge of said wall panel to said plurality of locations along said one of said plurality of edges of said overhead panel; said hinge joinder means comprising apertured plates each adapted to be fastened to said panels at one of said locations by

means of a threaded bolt passing through said apertured plates and into engagement with the inner surface of said metallic coil at such location;

d. said wall panel having a notch formed in the edge thereof opposite from said one of said plurality of edges thereof and an elongated structural member embedded therein and extending between said one edge and said opposite edge substantially perpendicularly thereto with one end of said elongated member terminating in said notch.

3,855,745

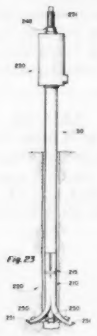
EARTH ANCHOR

Merle W. Patterson, and Lawrence C. Caves, Jr., both of Tulsa, Okla., assignors to Merit Systems, Inc., Tulsa, Okla.

Continuation-in-part of Ser. No. 400,015, Sept. 24, 1973,. This application Nov. 5, 1973, Ser. No. 412,826

Int. Cl. E02d *5/54, 5/80*

U.S. Cl. 52—159 **12 Claims**



1. Apparatus for making an earth anchor, comprising:

a pair of coaxially disposed sleeves each being at least scored along a portion of their lengths to facilitate separation of said sleeves between the scored portions upon application of a spreading force thereto,

a rod located within said sleeves of length sufficient to extend to near the surface of the earth when said sleeves are located at a desired depth within the earth,

wedge means attached to an end of said rod to engage at least the inner of said sleeves at its bottom,

a driving tube placeable over said rod to engage at least one of said sleeves at its top, and

means for applying a force between said driving tube and said rod whereby said wedge means is moved into said sleeves to apply a spreading force to flare the bottoms thereof.

3,855,746

MULTI-PURPOSE TRIM FOR DOOR AND WINDOW FRAMES

Robert Leggiere, 34 Whitlaw Ln., Westchester, N.Y.

Filed Jan. 25, 1971, Ser. No. 109,335

Int. Cl. E06b *1/14;* **E04b** *1/40*

U.S. Cl. 52—213 **1 Claim**

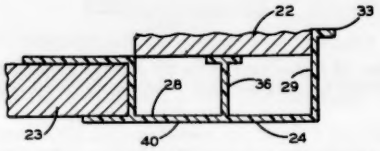
1. An interior and exterior casing trim for doors and window frames in the form of a linear unitary structure joining near-abutting and adjacent ends of structural components and surfacing components of a building nature lying in a mutual perpendicular plane, said device having a cross section comprising

A substantially horizontal base having an inner surface,

A substantially vertical extension integral one end of said horizontal base adjacent said inner surface, and

An L-shaped extension having an extremital end integral said inner surface in spaced relation to said vertical extension forming dual slots, one of which with said horizontal base and the other of which with both said vertical extention and said horizontal base,

said slots receptively engaging said structural component and said surfacing component at right angles to each other,



A second vertical extension integral the free end of said horizontal base adjacent said inner surface thereof in spaced relation to said L-shaped extension for snubbing engagement of said surfacing component,

A outwardly projecting horizontal extension for use in sealing abutment with a storm window, said latter horizontal extension secured in spaced relation to the ends of said first vertical extension, and

A T-shaped support integral said inner surface of said base between said L-shaped extension and said vertical extension for support of both said horizontal base and said structural component.

3,855,747

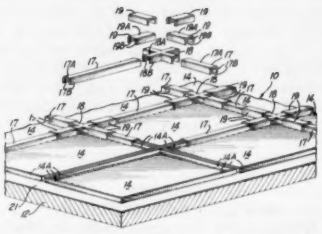
DECK CONSTRUCTION

Maurice W. Langan, Des Plaines, Ill., assignor to American Colloid Company, Skokie, Ill.

Filed Dec. 3, 1973, Ser. No. 420,780

Int. Cl. E04b *5/08*

U.S. Cl. 52—404 **5 Claims**



1. A waterproof deck construction for use on a structural deck comprising

a plurality of preformed one-piece shallow pans each having upstanding peripheral flanges and in close, spaced apart relation,

coping joining the confronting flanges of adjacent panels,

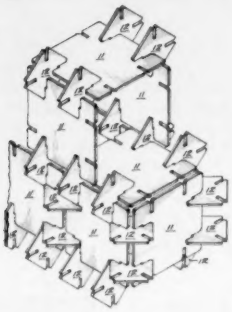
filler material nested in said pans, and

a continuous wear surface overlying said pans, coping and filler material.

3,855,748
PLAYGROUND ASSEMBLY SET

Jacob E. Thomas, 1715 Jefferson St., Port Townsend, Wash. 98368

Filed Dec. 15, 1972, Ser. No. 315,595
Int. Cl. E04c 1/10, 1/30
U.S. Cl. 52—585 6 Claims



1. A building set, the elements of which can be connected with one another to form modular structures, comprising:

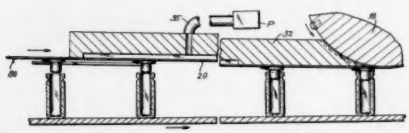
a plurality of thin-edged, multilateral, plate-like building elements having defined therein a plurality of first slots of predetermined uniform depth, including at least two slots opening onto each edge of said building element, each of said two slots being spaced an equal distance from the nearest corner of said building element; and,

a plurality of thin-edged, plate-like connecting elements substantially smaller in surface area than said building elements and having defined therein a plurality of second slots of predetermined uniform depth, said connecting elements joining with said building elements in slidable interconnection between said first and second slots, wherein the distance between adjacent first slots in a given edge of said building elements is equal to twice said equal distance plus the difference between the straight-line distance separating opposing second slots in said connecting element and a distance equal to twice the depth of said first slots.

3,855,749
STOPPER INSERTING MACHINE

John F. McMickle, Jr., Piscataway, N.J., assignor to Cozzoli Machine Company, Plainfield, N.J.

Filed Oct. 17, 1972, Ser. No. 298,330
Int. Cl. B65b 7/28; B67b 1/04
U.S. Cl. 53—306 7 Claims

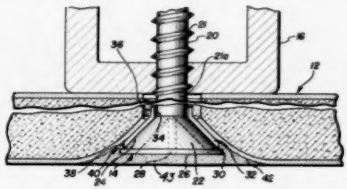


1. A machine for flying insertion of bottle stoppers into the mouths of bottles comprising means for moving bottles in a longitudinal direction in an upright position, a conveyor means, said conveyor means including means for moving bottle stoppers in a direction having a substantial component parallel to the longitudinal direction and in convergence with bottles moved by said bottle moving means, a rail structure, said rail structure including a gap through which the necks of bottle stoppers are adapted to extend when bottle stopper rims rest on the rail structure, said rail structure converging towards said bottle moving means in a direction having a substantial component parallel to the longitudinal direction and said conveyor means including means for moving bottle stoppers along said rail structure in the longitudinal direction, said means for moving bottle stoppers along said rail structure including an endless belt, said endless belt having means thereon for moving bottle stoppers along said rail structure, said means on said endless belt for moving bottle stoppers along said rail structure including elements thereon for abutting bottle stoppers on the rail structure and moving the same, a vacuum port located adjacent each bottle stopper mover element and extending completely through said endless belt, a manifold block located above said endless belt and having the same inclination as said rail structure, said manifold block having a bottom surface, an elongated slot extending along said manifold block bottom surface, means for communicating said elongated slot to a subatmospheric pressure and the bottom reach of said endless belt riding along the bottom surface of said manifold block.

3,855,750
SCREW ANCHORED WALLBOARD ASSEMBLY

Bernard F. Reiland, Rockford, Ill., assignor to Textron, Inc., Providence, R.I.

Filed Jan. 15, 1973, Ser. No. 323,879
Int. Cl. E04b 2/58; F16b 25/00, 39/26
U.S. Cl. 52—363 3 Claims



1. In combination with a wall structure comprising a plurality of supporting studs over which sheets of wall board are secured; a screw assembly penetrating said wall board and holding the same to said studs, said screw assembly comprising a cylindrical shank having threaded means formed therealong for threading the screw assembly through a wall board panel and into engagement with one of said support studs, said cylindrical shank having a leading end inserted into the support stud and a trailing end spaced from said support stud, a conical head formed integral with said trailing end of said shank, a radially extending annular flange formed about said conical head, a washer carried on said shank and having a conical portion complementally engaged with said conical head and an aperture formed centrally therein to receiving said cylindrical shank, said conical washer portion having a wall thickness, a radial extent and an axial length such that the outer conical surface of said conical portion engages the adjacent wall board surface forming an outwardly diverging depression therein and the maximum diameter edge of said washer is spaced inwardly of the peripheral edge of said flange and inwardly of the adjacent wall board surface in the depression to cooperate with said radially extending flange to form an annular recess immediately adjacent said flange on the underside thereof, with the top surface of said conical head being disposed beneath the normal outer surface of said wall board and with the peripheral edge of said flange spaced inwardly of the adjacent wall board surface in the depression to provide access opening to said recess, and a topping compound patch filling said depression and covering said screw, said topping compound being flowed through said access opening into said annular recess and hardened to provide gripping anchorage means for maintaining said patch in place.

3,855,751

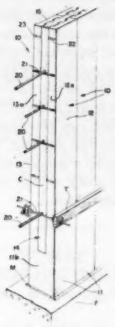
BUILDING BLOCK

Beacher Struthers, R.R. No. 2, Picton, Ontario, Canada

Continuation-in-part of Ser. No. 143,778, May 17, 1971, abandoned. This application Mar. 12, 1973, Ser. No. 339,752

Int. Cl. E04c *2/04*

U.S. Cl. 52—603 **7 Claims**



1. A structural member adapted to be stood upright, side by side, with adjacent identical members on a floor or slab for use in the construction of walls having smooth surfaces on each face and comprising:

a base portion of rectangular cross-section in plan and having a predetermined width dimension and a predetermined thickness dimension corresponding to the thickness of the said wall or the like and defining smooth, planar inner and outer sides spaced apart by said predetermined thickness dimension, and left and right hand sides spaced apart by said predetermined width dimension said width dimension being the same across the thickness of said base portion;

an inner panel portion formed integrally with said base and extending upwardly therefrom and having a thickness less than said base portion, said inner panel portion defining an inner side and left and right hand sides said inner side of said panel together with said inner side of said base forming the inner surface of said wall and said left and right hand sides forming continuous co-planar extensions of said base left and right hand sides and being spaced apart by the same said predetermined width dimension throughout the full thickness of said inner panel portion, said sides being adapted to abut closely with corresponding sides of adjacent said members when arranged as aforesaid, throughout their full height from said base to the top of said panel portion thereby to establish a smooth uninterrupted inner face for said wall when assembled as aforesaid, constituted by the inner sides of respective said inner panel portions and base portions;

an outer panel portion formed integrally with said base and extending upwardly therefrom and having a thickness less than said base, said outer panel portion defining an outer side and left and right hand sides, said outer side of said panel together with said outer side of said base forming the outer surface of said wall, and said left and right hand sides forming continuous co-planar extensions of said base left and right hand sides being spaced apart by the same said predetermined width dimension, throughout the full thickness of said outer panel portion said sides being adapted to abut closely with corresponding sides of adjacent said members when arranged as aforesaid, throughout their full height from said base to the top of said panel portion, thereby to establish a smooth uninterupted outer face for said wall when assembled as aforesaid, constituted by the outer sides of respective said outer panel portions and base portions;

and said inner side of said inner panel portion and said outer side of said outer panel portion tapering in towards one another from the base to the top thereof,

and said inner and outer panel portions defining between them a predetermined spacing forming a deep narrow channel, closed at its lower end by said base and open at its upper end said channel being continuous along the length of said wall for reception of a suitable filler material therein;

and a stand member formed integrally with said base and located in the centre of the underside thereof, having cross-sectional dimensions in the direction both of the width and thickness of said base, which are less than the width and thickness of said base, and having a flat undersurface whereby the same can function as a stand permitting the structural member to stand erect and supporting the weight of said structural member on said floor slab, and at the same time defining a space all around said stand member between said base and a floor slab for insertion of mortar or the like between said floor slab and said base.

3,855,752

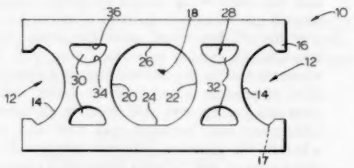
MASONRY BLOCK AND BUILDING PANELS

Norman N. Aylon, Willowdale, Ontario, Canada, assignor to General Concrete Ltd., Hamilton, Ontario, Canada

Filed Oct. 10, 1972, Ser. No. 295,896

Int. Cl. E04c *2/04, 1/08*

U.S. Cl. 52—605 **3 Claims**



1. A masonry block capable of cooperating with other like blocks to provide a structural panel, said block having a rectangular parallelepiped shape and including substantially parallel and smooth top and bottom faces and two end faces,

said block having an axial plane extending perpendicularly of said top and bottom faces and extending longitudinally of said block subdividing the width of said block into two areas of substantially equal dimension,

a central core extending between and substantially perpendicularly to the top and bottom faces and cross-sectionally shaped so that the portion thereof on one side of said plane is the mirror image of and has the same cross-sectional area as the portion thereof on the other side of said plane,

a recess formed in each end face and extending between said top and bottom faces, each of said recesses having the same cross-sectional dimension and having a combined cross-sectional shape and area substantially the same as those of the central core, and

four satellite cores positioned with a first two between the central core and the recess in one end face of the block an a second two between the central core and the recess in the other end face of the block,

each satellite core having substantially the same cross-sectional area and extending between and substantially perpendicularly to said top and bottom faces, the satellite cores being separated from each other, the central core and the recess within the block by material of construction of the block,

one member of each of said first and second two satellite cores being positioned on one side of said axial plane and each having substantially the same cross-sectional shape

and the other member of each of said first and second two satellite cores being positioned on the other side of said axial plane and each having the same cross-sectional shape which is the mirror image of the cross-sectional shape of said one member,

the central core having a cross-sectional shape consisting of two part-circular portions the ends of which are joined by straight line portions, the two part-circular portions of the central core having the same centre and radius of curvature, the centre of curvature of the two part-circular portions being located in said axial plane, the straight line portions of said central core being parallel to the longitudinal edges of the block,

each of the satellite cores having a cross-sectional shape which includes a semicircular portion and a diametrical portion joining the ends of the semicircular portion, the diametrical portions of said satellite cores being parallel to the longitudinal edges of the block,

the one members of said first and second two satellite cores having their diametrical portions in the same straight line and in straight line alignment with one of the straight line portions of the central core, the other members of said first and second two satellite cores having their diametrical portions in the same straight line and in straight line alignment with the other straight portion of the central core,

each recess having a crosss-sectional shape including a part-circular portion of substantially the same radius of curvature and circumferential length as the part-circular portions of said central core and having its centre of curvature located at the bisection of the plane of the respective end face and said axial plane,

the semicircular portions of the satellite cores projecting inwardly of the longitudinal areas of the block and the radius of curvature thereof being such that the furthest distance between the adjacent longitudinal edge of the block perpendicularly thereto and the semicircular portion is substantially equal to the radius of curvature of the part-circular portions of the central core and the part-circular portion of the recesses,

the total cross-sectional area of said satellite cores being less than the cross-sectional area of said central core,

the ends of said diametrical portions of said first two satellite cores closer to their adjacent recess lying in a plane which extends perpendicularly to the longitudinal edges of the block,

the ends of said diametrical portions of said second two satellite cores closer to their adjacent recess lying in a plane which extends perpendicularly to the longitudinal edges of the block,

the centres of curvature of the semicircular portion of said first two satellite cores being located substantially one-quarter of the length of the block from their adjacent end face,

the centres of curvature of the semicircular portions of said second two satellite cores being located substantially one-quarter of the length of the block from their adjacent end face.

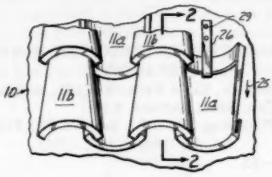
3,855,753

TILE AND TILE ROOFING

Cameron D. Terry, 2145B Almont Ave., Anaheim, Calif. 92806

Filed Apr. 13, 1973, Ser. No. 350,887
Int. Cl. E04d *3/362*
U.S. Cl. 52—520 **7 Claims**

1. A tile comprising a body having a center line lengthwise and being curved in the plane of its cross-section perpendicular to the center line so that the surface at one side of the body is convex and the surface at the other side concave, each end of the body being curved and having a pocket, the pocket at one end being at the concave side and the pocket at the other end being at the convex side, each pocket being formed by an engaging strip conforming with, and spaced from, the surface of the body at its end and having an opening facing toward the opposite end of the tile, said body having side edges at the



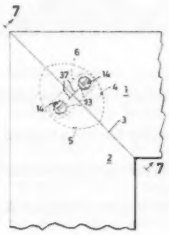
concave surface having side strips raised above the last mentioned surface, whereby a plurality of tiles can be interlocked end-to-end and also inverted to form ridges and valleys with protection against entry of rain or water beneath the ridges.

3,855,754

MITER JOINT LOCK AND COMBINATION

Wright A. Scoville, 20 S. Barneburg Rd., Medford, Oreg. 97501, and Chauncey J. Scoville, 7305 N.E. 39th St., Portland, Oreg. 97211

Filed Feb. 5, 1973, Ser. No. 329,358
Int. Cl. E04b *1/40*
U.S. Cl. 52—755 **7 Claims**



1. A miter lock device for clamping and locking together the end of one wooden member with the end of another wooden member, which ends have flat, parallel surfaces engageable for forming a miter joint:

a. an elongated strip of rigid material formed with an opening in each end;

b. one opening in one end of said strip having a straight cam engaging edge extending at a right angle to the length of said strip at the side of said opening nearest the end of the strip nearest thereto;

c. an elongated anchoring element adapted to extend through the outer opening in the other end of said strip and to project from opposite sides of said strip into one member of said pair;

d. an elongated cam element of uniform cross-sectional contour from end to end transversely of its length adapted to rotatably extend through said one opening and projecting from opposite sides of said strip for extending into the other member of said pair for supporting said cam element in said other member for rotation relative to said strip;

e. said cam engaging edge of said one opening being straight and said cam element having a flat side adjacent and facing said straight edge and a cylindrical cam surface extending around said cam element from said flat side engageable with said cam engaging edge upon rotation of said cam element when said cam element extends through said one opening with its ends rotatably supported in said

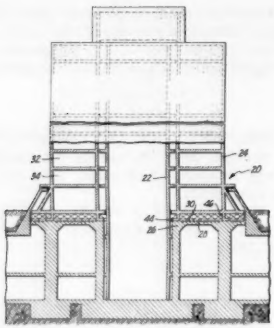
other member for applying a force to said strip in a direction away from said anchoring element to clamp and lock such joint together when said surfaces on said members are substantially together and said other end of said strip is anchored in said one member of said pair.

3,855,755

ROTATABLE BUILDING STRUCTURE HAVING FLUID BEARINGS

Robert E. Burdick, Santa Barbara, Calif., assignor to Rolair Systems, Inc., Santa Barbara, Calif.

Filed Aug. 30, 1973, Ser. No. 392,974
Int. Cl. E04b *1/346, 1/345*
U.S. Cl. 52—65 **5 Claims**



1. A building structure having a rotatable portion comprising in combination:
- a central core portion having a support base mounted in a fixed position;
- an outer rotor portion mounted about said core and supported thereby;
- a first horizontally disposed annular surface on said rotor portion;
- a second horizontally disposed annular surface on said core portion, said first and said second surfaces being oppositely positioned one another;
- a plurality of fluid bearings positioned in concentric rings connected to one of said annular surfaces and positioned between said surfaces for supporting, when operative, said rotor portion away from said core;
- means for rotating said rotor portion relative to said core portion;
- additional fluid bearings vertically positioned between said central core portion and said outer rotor portion to laterally support said outer rotor portion;
- a strut structure having upwardly extending legs, connected to said rotor portion said legs joined at their lower ends to a hinge member and said hinge member attached to a bearing plate; and wherein
- said rotating means comprises a drive wheel and a power source operatively connected thereto and connected to said core and rotor portions.

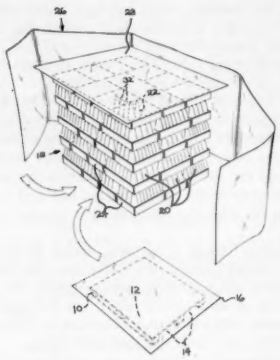
3,855,756

LOAD STABILIZATION

Roy P. Sweeney, La Mirada, and Robert W. Shull, Seal Beach, both of Calif., assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 637,522, May 10, 1967, abandoned.
This application Jan. 12, 1971, Ser. No. 105,947
Int. Cl. B65b *21/06, 53/02*
U.S. Cl. 53—26 **5 Claims**

1. A method of providing a stable, unitized pallet load of multitudinous containers such as glass bottles, jars and the like, comprising the steps of:
- positioning a pallet having a load supporting surface in a container loading location;
- positioning a base sheet of heat shrinkable plastic material on said pallet, load supporting surface;
- stacking a substantial plurality of container subassemblies in a suitable array upon said base sheet leaving a peripheral portion of said base sheet exposed;
- wrapping a heat shrinkable plastic material about the sides of said stacked array;



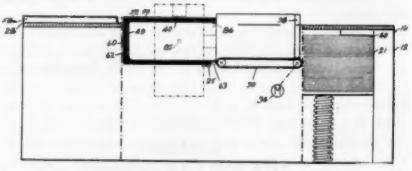
- draping a top-sheet of a heat shrinkable plastic material upon the upper surface of said stacked array, and bringing the draped portion of said top sheet and the peripheral portion of said base sheet into contact with said side wrapping sheet;
- shrinking said material into intimate contact with the exterior surfaces of said stacked array, thereby forming a complete enclosure for the top and sides of the stacked array which exerts an inward restraining action thereupon.

3,855,757

AUTOMATIC BAGGING DEVICE

Stanley Joseloff, Eastman Shore, Lanconia, N.H. 03346

Filed Oct. 17, 1973, Ser. No. 407,080
Int. Cl. B65b *43/54, 67/04*
U.S. Cl. 53—188 **2 Claims**



1. In an automatic bagging device for use with a bag of predetermined size and configuration, and articles of merchandise at a check-out counter, the improvement comprising: a merchandise receiving compartment disposed in said counter including a pair of side walls and an end wall, a compartment belt forming a bottom wall of said compartment, said compartment being of a size and configuration substantially the same as an opened bag; a bag receptacle juxtaposing said compartment at a lonogitudinal end thereof opposite said end wall; means to move said belt in a direction of said bag receptacle to empty the contents of said compartment into

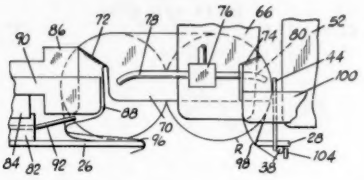
said bag receptacle, bag opening means sensitive to the presence of an unopened bag disposed in said receptacle, bag supply means disposed adjacent and beneath said end wall of said compartment, said bag receptacle having a first bag and merchandise receiving position and a second bag removal position pivotally related to said first position, and latch means retaining said bag receptacle in said first position, release of said latch means allowing shift of said bag receptacle to said second position under the weight of a loaded bag.

3,855,758

FIXED LONGITUDINAL SIDE FOLDER

Frederick L. Walter, White Cloud, and Ronald Holt, Battle Creek, both of Mich., assignors to Battle-Creek Packaging Machinery Div. of Franklin Electric Subsidiaries, Inc., Bluffton, Ind.

Filed May 17, 1973, Ser. No. 361,279
Int. Cl. B65b *11/22*
U.S. Cl. 53—226 **10 Claims**



1. In combination in a package wrapping machine having an article feeding conveyor, an elevator arranged to lift articles from said conveyor, a reciprocable front bottom folder to support articles raised by said elevator, an oppositely reciprocable rear bottom folder, means for delivering a wrapper sheet of film material larger than the article into a plane above the articles on the lowered position of the elevator, means to eject packages from the elevated position of said elevator with wrapper sheets therearound, and a receiving way adapted to receive packages from said elevator and seal folds in said wrapper sheet, slide fold forming mechanism comprising:

means immovably supporting fixed side folder plates in upright position over said elevator and in spaced relation to guidingly receive the sides of articles raised by the elevator,

front side folder plates located over said front bottom folder,

means for reciprocating said front side folder plates with their rear edges spaced apart to receive articles therebetween,

said reciprocating means being arranged to advance said front side folder plates to adjacent the front edges of said fixed side folder plates,

and nozzle means arranged to direct air jets forwardly beyond the front edges of said fixed side folder plates and rearwardly beyond the rear edges thereof.

3,855,759

METHOD AND APPARATUS FOR CLOSING AND/OR SEALING RECEPTACLES

Elmer E. Pohlenz, Richmond, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Nov. 20, 1972, Ser. No. 307,963
Int. Cl. B65b *7/28*
U.S. Cl. 53—342 **5 Claims**

1. An apparatus for closing and/or sealing receptacles comprising:

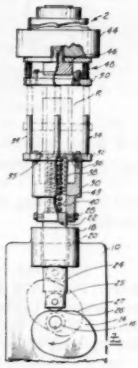
a support assembly adapted for mounting a receptacle having a sidewall and an open top,

a head assembly adapted to receive a closure having a depending skirt with an outwardly projecting annular bead thereon,

said support assembly and said head assembly being adapted to be positioned relative to each other so that said closure is disposed on the top of said receptacle with said skirt disposed adjacent an outwardly facing surface near the top of the sidewall of said receptacle,

said head assembly including first and second dies,

means to position the top of said closure against said first die,



said second die including a draw ring having means to permit said closure to be disposed circumferentially inside said die with said projection being disposed above said draw ring,

said draw ring being adapted to be moved upwardly with respect to the closure and container to engage the bead on the closure as restrained by said first die to constrict the bead radially inwardly towards the side wall of the receptacle as the draw ring is moved upwardly past the bead on the closure, and

drive means for providing the relative motion between said draw ring and said closure and container.

3,855,760

PEPPER HARVESTER

Jay G. Smith, Jr., and Jerry R. Joyce, both of Forsyth, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Apr. 5, 1973, Ser. No. 348,402
Int. Cl. A01d *45/22*
U.S. Cl. 56—13.2 **13 Claims**

1. An apparatus for harvesting vegetable crops such as peppers, peas, beans and the like including:

a. a motorized vehicle which can be moved along a row of vegetable plants;

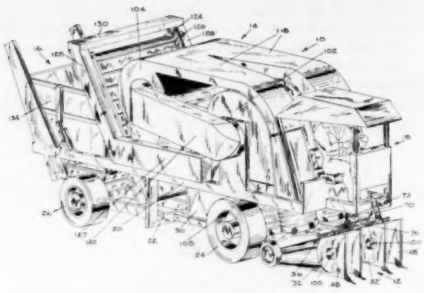
b. stripper means carried on the forward end of the vehicle for receiving the vegetable plants as the vehicle moves along said row, said stripper means removing an aggregate of fruit and foliage from the plants' stalks;

c. a separator means carried on said vehicle for receiving the aggregate from said stripper means;

d. blower means carried on the vehicle which communicate with said stripper means and said separator means, said blower means generating a positive and negative air current to entrain the aggregate in an airstream and pneumatically convey the aggregate from the stripper means to the separator means wherein the aggregate is separated from the airstream;

e. means for driving the blower means;

f. first conveyor means carried on said vehicle and associated with said separator means for receiving and transporting the aggregate discharged from said separator means; and



g. collection means for receiving the aggregate from said first conveyor means.

3,855,761

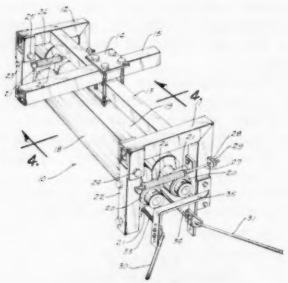
APPARATUS AND METHOD FOR REMOVING TASSELS

Robert A. Louks, and Gordon D. Louks, both of Gilman, Iowa

Continuation of Ser. No. 225,085, Feb. 10, 1972, abandoned. This application Apr. 12, 1973, Ser. No. 350,586

Int. Cl. A01d *45/02*

U.S. Cl. 56—51 **5 Claims**



1. A device for removing tassels from cornstalks comprising:

a framework;

a pair of horizontal rotatable cylindrical members having axes extending substantially parallel to the direction of travel of the device, said cylindrical members being in parallel contacting relationship and supported by the upper portion of said framework to dwell substantially above ground level adjacent the upper portion of said stalks, the outer surfaces of said members being of slightly resilient material;

means on said framework for rotating said cylindrical members;

stalk contacting means disposed forwardly of said rotatable cylindrical members, the stalk contacting means being adapted to bend stalks forwardly of the rotatable cylindrical members so that said stalks are in a forwardly bent position as said device moves forwardly thereover;

guide fingers carried by said framework and extending forwardly and outwardly from said cylindrical members to guide the upper portions of said stalks to engagement with said stalk contacting means;

and guard means carried by said framework and disposed below said rotatable cylindrical members, said guard means comprising spaced apart elongated members adapted to inhibit contact between plant leaves and the rotatable cylindrical members as the tassels are pulled from said stalks by said cylindrical members as they are rotated upon the forward movement of said device, said elongated members being spaced horizontally apart a distance sufficient to permit said tassels to pass freely therethrough but close enough together to restrain the engagement of leaves with said cylindrical members.

3,855,762

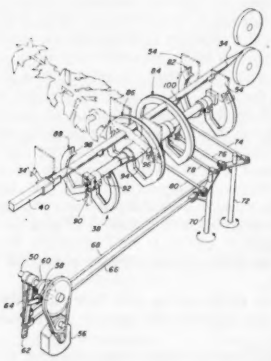
TOBACCO HARVESTER WITH IMPROVED SPEARING SYSTEM

Carlisle A. Middleton, 28 Dungarrie Rd., Baltimore, Md. 21228

Continuation-in-part of Ser. No. 365,564, May 31, 1973, Pat. No. 3,798,884. This application Feb. 25, 1974, Ser. No. 445,156

Int. Cl. A01d *45/16*

U.S. Cl. 56—27.5 **17 Claims**



1. In a tobacco harvester having a horizontally disposed spear with a pointed front, means for incrementally conveying tobacco plants for impalement of the stalks thereof on the spear, and means for gripping the spear alternately at different positions in synchronism with said incremental conveying to permit moving of impaled tobacco plant stalks therealong, the improvement comprising: the means for gripping the spear comprising: a plurality of sets of opposed arcuate jaws spaced along the length of the spear, means for mounting all said jaws about an axis parallel-spaced below the spear at a location positioning the jaws to open and close laterally of the spear.

3,855,763

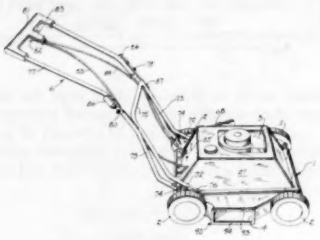
SELF-PROPELLED ROTARY LAWN MOWER

Lester H. Seifert, R.R. No. 2, Park Ave. Kiel, Wis. 53042; Raymond P. Powers, 3515 N. 10th St., Sheboygan, Wis. 53081; William M. Schmidt, 35 Claireview Rd., Grosse Point Shores; Stanley E. Thorwaldsen, 286 Williams St., Grosse Point Farms, both of Mich. 48236; Frederick W. Smith, 247 Cambridge, Mt. Clemens, Mich. 48043; David C. McElroy, 22000 St. Gertrude, St. Clair Shores, Mich. 48081, and Roy P. Dunton, 37446 Charter Oaks, Mt. Clemens, Mich. 48043

Division of Ser. No. 289,539, Sept. 14, 1972, Pat. No. 3,802,170. This application Feb. 11, 1974, Ser. No. 441,634

Int. Cl. A01d *35/26;* **B62b** *3/02*

U.S. Cl. 56—320.2 **3 Claims**



1. A folding handle assembly for a rotary lawn mower, said mower including a housing, an engine mounted on the housing, and cutting means located within the housing and operably connected to said engine, said handle assembly including a first handle member pivotally connected to the housing at a first pivot, a second handle member pivotally connected to the housing at a second pivot located forwardly of said first pivot, a third handle member connected to the first handle member at a third pivot spaced above said first and second pivots, and releasable locking means removably interconnecting said second handle member and said third handle member with said first handle member, said locking means located between the housing and said third pivot, release of said locking means enabling the first and second handle member to be pivoted from an extended operating position to a folded position within the perimeter of the housing.

3,855,764

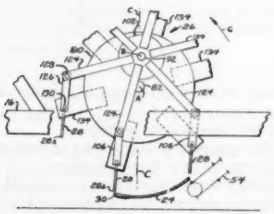
ASPARAGUS HARVESTING APPARATUS AND METHOD

Clarence R. Helbing; Russel Peters, and Hugh E. Cooper, all of Rochelle, Ill., assignors to Towner Manufacturing Company, Santa Ana, Calif.

Filed Nov. 14, 1973, Ser. No. 415,674

Int. Cl. A01d *45/00*

U.S. Cl. 56—327 A **18 Claims**



1. Apparatus for harvesting field growing asparagus and the like comprising, a frame or vehicle adapted to be moved in a forward direction, a horizontally disposed abutment supported by said frame at a level at which the asparagus is to be harvested, reel means mounted on said frame to rotate about a first horizontal axis disposed above said abutment, at least one snapping bar mounted on said reel means to swing about a second horizontal axis radially spaced from and parallel to said first horizontal axis and to be carried with rotation of said reel means about said first horizontal axis downwardly ahead of an asparagus clump approached by said frame and across said abutment to snap the asparagus therebetween, and means holding said reel-mounted snapping bar in a constant vertical disposition as it moves downwardly and across said abutment.

3,855,765

LADDERLESS, CONTINUOUSLY USABLE, RAPID FRUIT PICKER AND CONVEYOR

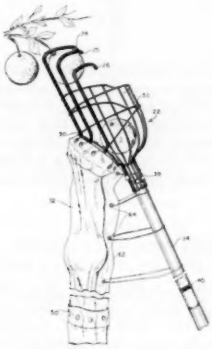
Claude E. Forkner, Deland, and Charles T. O'Rork, Jr., Orlando, both of Fla., assignors to F & O Research and Development Company, Deland, Fla.

Filed Dec. 29, 1972, Ser. No. 319,619

Claims priority, application Great Britain, Jan. 7, 1972, 891/72; Feb. 11, 1972, 6614/72

Int. Cl. A01g *19/08*

U.S. Cl. 56—340 **10 Claims**



1. A picking basket adapted to be supported by an elongate hand held pole and utilized in picking fruit from a tree on a continuous basis without the need for a ladder or for lowering said basket, said basket being essentially cylindrical in nature and comprising an open upper fruit-receiving end, a lower end defining a handle-engaging socket adapted to receive one end of the elongate hand held pole utilized in reaching fruit located high on a tree, and a central portion defined between said upper and lower ends, in which central portion is defined a fruit-in-transit containing location, said open upper end being defined by a rim, said upper end having a forward portion and a rear portion, said forward portion involving a substantially open rim portion, and said rear portion including a plurality of spaced, elongate fruit-engaging fingers said fingers extending upwardly beyond said rim and being of a hooked configuration so as to be able to at least partially surround fruit to be picked, and an outlet disposed in said central portion and below said fingers, said outlet being located adjacent but above said handle-engaging socket and being of a diameter such that fruit separated from the tree can pass therethrough, and an elongate tubular fruit conveyor means adapted to be attached to to said basket adjacent said outlet, said conveyor means being of stretch fabric of a diameter normally smaller than the fruit being picked, but being capable of stretching at such time as fruit from the central portion of said basket passes through said outlet and enters said conveyor means, and by such stretch action serving to slow the rate of descent of the fruit sufficiently as to prevent damage

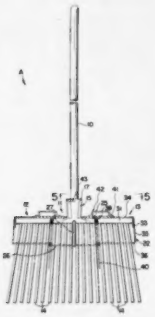
thereto upon reaching the lower terminus of its travel, said picking basket in use normally being disposed at an angle to the ground, with said rear portion of said upper end of said basket being nearest the ground, such that fruit separated from the tree by the use of said fingers can move downwardly along said fingers, along the interior of said central portion of said basket, then roll immediately to said outlet means, and thence pass downwardly along said conveyor means.

3,855,766

CONVERTIBLE BROOM RAKE

Verna Lutz, 424 Center St., Ashtabula, Ohio 44004

Filed July 23, 1973, Ser. No. 381,506
Int. Cl. A01d *7/00*
U.S. Cl. 56—400.18 **6 Claims**



1. A lawn and garden broom rake adapted for selective use as both a lawn rake and a shrub rake comprising:

a handle,

three rake sections with prongs including a center section connected to and generally parallel to said handle, and two end sections pivotally connected to said center section whereby each end section is pivotable about an axis generally aligned with said handle, between an open, lawn rake position to form a relatively wide span of adjacent raking prongs, and a folded position overlying one another and overlying said center section on the rearward side thereof whereby only the center section is operable for raking, and

means operatively associated with said center section for securing said end sections in each of said positions.

3,855,767

APPARATUS FOR PRODUCING CORE YARN FOR ANTISTATIC CARPET

Robert W. Horsey, 51 Kingsford Ct., Kanata, Ontario, and Emil John Brychta, 330 John St. N., Arnprior, Ontario, both of Canada

Filed Mar. 1, 1973, Ser. No. 337,233
Int. Cl. B65h *81/08*
U.S. Cl. 57—18 **4 Claims**

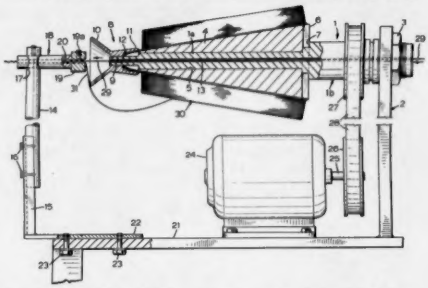
1. An apparatus for producing an antistatic carpet yarn which comprises:

a. a rotatable cabler shaft including a yarn package holder, a spindle mounted on the apex of said package holder and an axial bore through said cabler shaft and spindle for passing textile yarn therethrough:

b. a yarn guide mounted downstream of said cabler shaft and spindle and spaced therefrom;

c. a passage through said yarn guide coaxial with the axial bore of said cabler shaft and spindle for continuing the passage of said textile yarn;

d. said spindle comprising a cabler shaft engaging portion and a funnel portion downstream of the shaft engaging



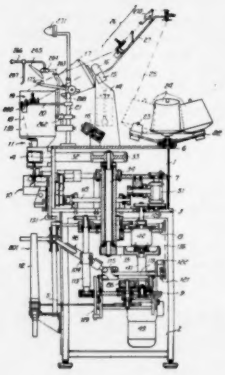
portion which includes an outer edge for directing a length of conductive yarn from a yarn package mounted on said yarn package holder to a length of textile yarn passing through the passage of said yarn guide and cabling on said length of textile yarn when said cabler shaft is rotated.

3,855,768

MANUFACTURE OF CHENILLE YARN

Modesto Lopez Jubany, Calle Santa Madrona, 88, Badalona, Barcelona, Spain

Filed June 14, 1973, Ser. No. 369,986
Claims priority, application Spain, July 4, 1972, 404853
Int. Cl. D02g *3/42*
U.S. Cl. 57—24 **16 Claims**



1. A machine for the manufacture of chenille yarn comprising

a. at least two core thread bobbins;

b. means for longitudinally supplying at least two first core threads from the core thread bobbins;

c. a supply creel for chenille effect thread, said supply creel being situated remote from said bobbins at a freely accessible location;

d. winding-on means for conveying the chenille effect thread from the supply creel, forming a balloon of rotating chenille effect thread about the core thread bobbins and winding the rotating chenille effect thread around the longitudinally supplied first core threads;

e. feed means for supplying at least two external second core threads laterally to the wound-on chenille effect thread around the said first core threads to form at least two two pairs of core threads composed of one first and one second core thread;

f. means for severing the turns of the chenille effect material between the pairs of core threads; and

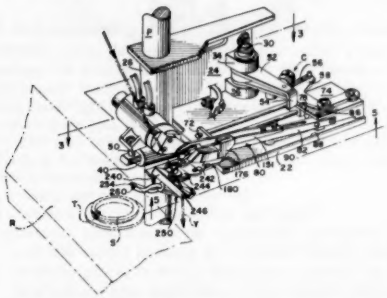
g. twisting and winding-on means for twisting each pair of core threads into a chenille yarn.

3,855,769

STRAND THREADING MECHANISM FOR RING TEXTILE MACHINES

Robert Earl Morton, Warwick, R.I., assignor to Leesona Corporation, Warwick, R.I.

Filed Sept. 19, 1973, Ser. No. 398,591
Int. Cl. D01h *15/00*
U.S. Cl. 57—34 R **17 Claims**



1. In an automatic multi-station textile strand processing machine of the ring and traveler type equipped with a motor-driven traveling tender carriage capable of detecting the existence of an abnormal condition at a processing station on the machine and servicing the station to restore it to normal operation, including re-threading said strand through the ring and engaged in the traveler, said carriage having a sub-carriage arranged thereon for vertical movement in synchronism with the ring, an improved threading mechanism comprising a threader fork assembly mounted on said sub-carriage for generally reciprocating travel from an inoperative position spaced from said ring to an operative position to wrap the thread arcuately around the ring, a thread lifting sub-assembly having forward and rear ends and carried on said fork assembly for relative longitudinal displacement, said thread-lifting sub-assembly including a lifter lever rockably carried on said lifter sub-assembly proximate the forward end thereof and having a thread engaging extension projecting therefrom, means on said fork assembly for rocking said lifter lever upon relative displacement of said lifter sub-assembly, and stop means fixed on said sub-carriage for engaging said sub-assembly at a point intermediate the ends of travel of said assembly to preclude further motion of the sub-assembly while permitting further travel of said assembly.

3,855,770

MACHINES ACTING ON CONTINUOUSLY RUNNING TEXTILE YARNS

Frederick Hugh Howorth, Withnall, England, assignor to Howorth Air Conditioning Limited, Bolton, England

Filed Dec. 5, 1972, Ser. No. 312,318
Claims priority, application Great Britain, Dec. 9, 1971, 57162/71
Int. Cl. D02g *1/02*; **D01h** *11/00*
U.S. Cl. 57—34.5 **1 Claim**

1. A suction apparatus for a machine for processing continuously running textile yarns to enable bobbins to be doffed without stopping the machine the invention comprising a suction tube formed with a plurality of holes therein spaced along the length of the tube, low volume high suction means connected to one end of said tube, and a sleeve of resilient material slidably mounted on the tube adjacent each hole for selectively covering and sealing the holes not in use for carrying away yarn ends during doffing and when an end breaks, each said sleeve being sufficiently pliable that when in position

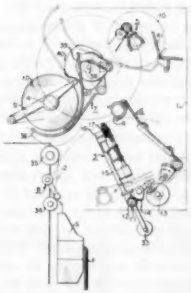
to fully cover the associated hole the sleeve is deformed by the suction within the tube into positive sealing contact all around the perimeter of the hole, said suction tube being about 1 inch in internal diameter, said holes each being about one-half an inch in diameter, and said suction means operating to draw air through said tube at a pressure of about 80 inches W.G. and a velocity of about 400 cubic feet per minute.

3,855,771

DEVICE FOR BIASING YARN INTO FIXED POSITION FOR USE WITH YARN CUTTING MECHANISM OF AUTOMATIC DOFFING APPARATUS

Toshio Yoshizawa, Chiryu; Yasuo Yamada; Toshinori Taniguchi, both of Kariya; Tatsuo Kose; Kazuo Ohchi, both of Yoshibara, and Kiyokazu Hori, Sabae, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Aichi-Prefecture and Daiwa Boseki Kabushiki Kaisha, Osaka, both of, Japan

Filed Dec. 5, 1973, Ser. No. 421,926
Int. Cl. D01h *9/16*, *9/10*
U.S. Cl. 57—53 **8 Claims**



1. A device for biasing a yarn into a fixed position for use with a yarn cutting mechanism of an automatic doffing appa-

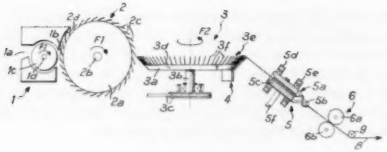
ratus for doffing full packages one by one from a plurality of spinning units, arranged side-by-side, of a spinning machinery while travelling along the front of the spinning machinery, said cutting mechanism being movable into a yarn cutting position to cut the yarn prior to doffing the corresponding full package: said device comprising a divergent yarn guide disposed in the vicinity of a cutter of said cutting mechanism and formed with a yarn restraining part, the yarn being guided to traverse along the divergent surface of said yarn guide when said cutting mechanism is brought into said yarn cutting position; and means for forcibly directing the yarn traversing along the yarn guide surface toward said yarn restraining part when the yarn is to be cut, whereby the yarn is cut effectively and surely always at the fixed position and in a very short time.

3,855,772

METHOD OF AND APPARATUS FOR PRODUCING YARN

Jean-Etienne Burlet, Roubaix, France, assignor to Centre Technique Industriel dit: Institut Textile De France, Boulogne sur Seine, France

Filed Aug. 29, 1973, Ser. No. 392,447
Claims priority, application France, Sept. 1, 1972, 72.31388
Int. Cl. D01h 1/12
U.S. Cl. 57—58.95 **16 Claims**



1. A method of spinning yarn in which a roving or sliver of substantially parallel carded fibres are worked into a yarn being formed by twisting, such a method comprising transforming the roving or sliver of fibres into a fringe of individual fibres or groups of fibres mechanically suspended by one of their ends, the free ends of the suspended fibres being progressively and successively supplied to the open end of the yarn being formed in a manner such that a major portion of each fibre is substantially parallel to the yarn being formed in the region of the open end of the said yarn, and the said end of each fibre being held until the fibre has been integrated into the yarn by the influence of the rotational effect imparted to the yarn by the twisting motion.

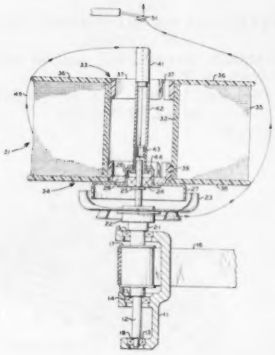
5. Apparatus for spinning yarn, such apparatus comprising feed means, said feed means including a rotary drum, a carding device for receiving a roving or sliver of fibres from the feed means, the carding device including a carding cylinder provided on its circumference with a plurality of carding pins, the carding cylinder being rotatable about an axis parallel to the axis of rotation of the said rotary drum, a rotatable combing disc for receiving a roving or sliver of carded parallel fibres from the carding cylinder, the combing disc being rotatable about an axis perpendicular to the axis of rotation of the carding cylinder, the combing disc being provided on a peripheral surface with a plurality of radially arranged pins adapted to co-operate with the pins of the carding cylinder and being inclined relative to the axis of rotation of the combing disc to extend beyond the periphery of the combing disc for forming a fringe of yarn fibres mechanically secured by one of their ends to the said pins doffing means for doffing the said fibres from the combing disc, and twisting means for twisting fibres doffed from the combing device onto a yarn.

3,855,773

TWO-FOR-ONE TWISTER

James L. Davis, Greenville, S.C., assignor to Phillips Fibers Corporation, Greenville, S.C.

Filed May 7, 1973, Ser. No. 357,650
Int. Cl. D01h 7/86
U.S. Cl. 57—58.83 **6 Claims**



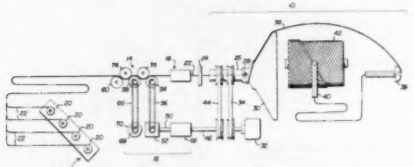
1. A coverless two-for-one yarn twister comprising a support bracket, a spindle, means mounting said spindle in said support bracket for rotation about the longitudinal axis of said spindle, a rotor means mounted on said spindle above said bracket for rotation with said spindle, said spindle being provided with a yarn passageway extending axially from the upper end thereof to a point adjacent said rotor means and then radially outwardly, said rotor means being provided with yarn guide means, bearing means mounted on said spindle above said rotor means and having an outer member which does not rotate with said spindle, bobbin support means mounted on said outer member of said bearing means and having a bobbin support surface extending outwardly in a plane perpendicular to said longitudinal axis of said spindle, a cylindrical bobbin, centering means on said bobbin support means for positioning said bobbin in a position coaxial with said spindle, a first annular bobbin cap adjacent the end of said bobbin closest to said rotor means and extending radially outwardly from said bobbin in a plane perpendicular to said longitudinal axis of said spindle, a second annular bobbin cap adjacent the other end of said bobbin and extending radially outwardly from said bobbin in a plane perpendicular to said longitudinal axis of said spindle, the diameter of said first and second bobbin caps being greater than the diameter of the yarn package formed on said bobbin, the diameter of said first bobbin cap being significantly greater than the maximum diameter of said rotor means above the path of the yarn so that the yarn emerging from the yarn passageway of said spindle and passing through said yarn guide means on said rotor means makes contact with the outer periphery of said first bobbin cap during the initial portion of the time required to bring said spindle from rest to the desired rate of rotation about said longitudinal axis, the diameter of said second bobbin cap being significantly greater than the diameter of the yarn package formed on said bobbin so that the yarn being unwound from said yarn package and entering the yarn passageway of said spindle makes contact with the outer periphery of said second bobbin cap during the initial portion of the time required to bring said spindle from rest to the desired rate of rotation about said longitudinal axis.

3,855,774

APPARATUS FOR WINDING A PLURALITY OF LINEAR MATERIALS

Raymond E. Hurley, Heath, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 26, 1973, Ser. No. 326,704
Int. Cl. D01h 1/28
U.S. Cl. 57—81 2 Claims



1. In strand winding apparatus having a plurality of individual strand supply packages rotatably mounted on a creel for supplying the strands to be wound, said creel having a long path through which the strands are threaded to accumulate a substantial length of each strand between its package and the exit point from said creel, and electrically driven strand feeding means and twisting means, the improvement comprising:
a flywheel for maintaining the speed of said strand feeding means substantially constant;
a brake connected to said flywheel;
a time delay circuit connected to said brake;
tachometer generator means operatively connected to at least one supply package to be driven thereby, said tachometer generator means operative to generate an electrical signal whose magnitude is proportional to the rotational speed of its assoticated supply package;
a detector circuit responsive to a biasing signal and to the signal from said tachometer generatoe means for closing an electronic switch when the magnitude of at least one tachometer generator signal drops below a redetermined minimum; and
power interruption means responsive to the closing of said electronic switch for stopping said strand twisting means and for actuating said time delay circuit;
said time delay circuit for actuating said brake to stop said flywheel and said strand feeding means after said twister means has stopped.

3,855,775

PROCESS FOR PRODUCING PLY YARN FROM THREADS OF FIBERS

Etienne Valdelievre, Lille, France, assignor to Inter Textiles Europeen, Lille, France

Filed Oct. 26, 1971, Ser. No. 192,339
Claims priority, application France, Oct. 29, 1970, 70.39080
Int. Cl. D02g 3/04, 1/20, 3/28
U.S. Cl. 57—140 BY 16 Claims

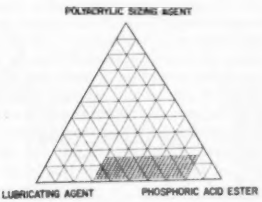
1. A process for producing a voluminous balanced and elastic ply yarn comprising a plurality of single threads of a mixture of non-keratinous natural fibres and discontinuous man-made fibres, comprising:
twisting each of said single threads in a first direction, with a twist factor α_1 of 95–110 then thermosetting each of said twisted single threads,
twisting said single twisted threads together into a ply yarn having an initial twist in a second direction opposed to the first direction, with an initial twist factor α_2 of 110–125, thermosetting said initial twist of said ply yarn,
untwisting the ply yarn by twisting the ply yarn in said first direction opposed to said initial twist then overtwisting the ply yarn in said first direction with a twist factor $\alpha 3$ of 275–290 while heat treating the ply yarn in said overtwisted state to a temperature which is sufficient to permanently modify the molecules of the man-made fibres but insufficient to impair the natural fibres,
returning the ply yarn to said initial twist then relaxing the ply yarn and winding said ply yarn onto a support,
the process further comprising imparting to the ply yarn before said heat treatment a moisture content by weight which exceeds the official moisture regain rate of the mixture of fibres.

3,855,776

SYNTHETIC THERMOPLASTIC MULTIFILAMENT YARNS

Etuzou Omura; Toshio Minami, and Tetsuhiro Kusunose, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed June 19, 1972, Ser. No. 264,104
Claims priority, application Japan, June 22, 1971, 46-44504; Sept. 20, 1971, 46-72508; Dec. 5, 1971, 46-87585; Dec. 5, 1971, 46-87586; Dec. 5, 1971, 46-87587
Int. Cl. D02g 3/36; B32b 27/02
U.S. Cl. 57—153 9 Claims



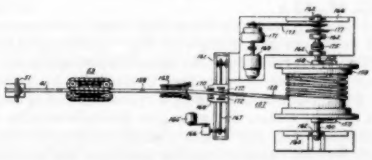
1. A synthetic thermoplastic multifilament yarn having at most 100 twists per meter carrying about 0.5 to 3.0 percent, based on the weight of the yarn, of a treating agent comprising about 5 to 68 percent by weight of a liquid, synthetic yarn lubricating agent, about 30 to 80 percent by weight of a self-emulsifying organic phosphorus-containing surface active agent having a HLB of from about 4 to 15 and about 2 to 15 percent by weight of a polyacrylic sizing agent, the polyacrylic size being present in about 0.02 to 0.25 percent, based on the weight of the yarn.

3,855,777

REEL OF ALTERNATELY ROTATED PARALLEL-WIRE STRAND AND METHOD OF MAKING

Jackson L. Durkee, Bethlehem; Arthur F. Beighley, Williamsport, both of Pa., and Donald E. Dunlap, deceased, late of Montoursville, Pa. (by Mary E. Dunlap, administratrix), assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Continuation-in-part of Ser. No. 575,038, Aug. 25, 1966, Pat. No. 3,526,570. This application June 4, 1970, Ser. No. 43,464
Int. Cl. D07b 5/00
U.S. Cl. 57—156 23 Claims



1. A method of reeling a suspension cable strand comprising a bundle of a large number of parallel and axially extending wires, which comprises the steps of feeding said strand axially

to a drum, rotating said strand in advance of its movement to said drum to twist the outer wires in said strand into a helical path with respect to the central wires therein, said central wires extending centrally and axially with respect to said helically extending outer wires, and winding the strand on said drum, said twist being retained in the strand during reeling on said drum and being effective to eliminate the development of slack in the wires of the strand as it is wound on the drum, and to enable the wires in the said strand to revert to their said axially extending and parallel arrangement relative to each other upon unreeling from said drum.

3,855,778

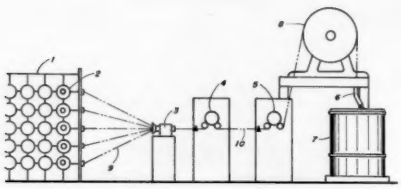
PROCESS FOR FORMING AN IMPROVED FIBER TOW BY APPLYING FALSE TWIST TO THE TOW

Adolph John Brandi, and James Vincent Muthig, both of Columbia, S.C., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Sept. 7, 1973, Ser. No. 395,101

Int. Cl. D01h *5/00*

U.S. Cl. 57—156 **5 Claims**



1. In a method of combining multiple continuous running lengths of ends of undrawn multifilament yarn into a tow, the improvement comprising

combining said ends by passing said ends through means to impart false twist to said combined ends and

maintaining uniform lay by said twist breaking any tight end,

trapping broken loose ends by wrapping said loose ends about other continuous ends with said twist,

said ends of yarn being continuous multifilament yarn.

3,855,779

PIVOTING DEVICE FOR THE WINDING WEIGHT OF AN AUTOMATIC WATCH

Urs Giger, Solothurn, and Friedrich Perrot, Lengnau, both of Switzerland, assignors to ETA A.G. Ebauches-Fabrik, Grenchen, Switzerland

Filed Jan. 28, 1974, Ser. No. 436,921

Claims priority, application Switzerland, Feb. 22, 1973, 2532/73

Int. Cl. G04b *5/02, 13/02*

U.S. Cl. 58—82 A **6 Claims**

1. A pivoting device for a winding weight of an automatic watch movement, comprising a winding weight support having a flat ring shaped portion with a circular opening therein, said support being intended to be fixed to the frame of said movement, a one-piece boss including a cylindrical sliding surface, a first banking surface and means for driving a winding train of said movement, and further a member, integral with said winding weight, rigidly secured to said boss and including a second banking surface, said second banking surface extending opposite said first banking surface, said ring shaped portion extending between said banking surfaces and said circular opening engaging said cylindrical sliding surface.

3,855,780

ELECTRONIC CLOCK DEVICE

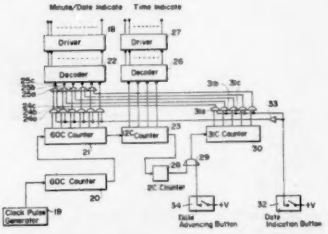
Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Mar. 15, 1973, Ser. No. 341,585

Claims priority, application Japan, Mar. 15, 1972, 47-26382

Int. Cl. G04b *19/24*

U.S. Cl. 58—4 A **6 Claims**



1. A digital indication type electronic clock device comprising:

a clock pulse generating means generating clock signals of a specified, highly stable frequency;

a minute counting means responsive to said clock signals for generating minute signals by counting said clock signals from said clock pulse generating means and for generating a carry signal every 60 minutes;

an hour counting means actuated by the carry signals from said minute counting means for generating hour signals and for generating a carry signal every 24 hours;

a date counting means actuated by the carry signals from said hour counting means for generating date signals;

an hour indication means coupled to the hour counting means for performing digital indication of the counts of the hour counting means;

a minute/date indication means capable of optionally indicating on a single indication portion the output counts of the minute counting means and of the date counting means;

a manually operated switch means for selectively causing said minute/date indicating means to indicate minutes and/or date;

a first group of AND circuits and OR circuits coupled to said minute counting means coupling said AND circuits to said minute date indication means for selectively supplying said minute/date indication means with the minute signalsfrom the minute counting means when said manual switch means is not being operated; and

a second group of AND circuits coupled to said manual switch means and coupling said minute/date indication means to the date counting means through said OR circuits for selectively supplying said minute/date indication means with the date signals from the date counting means responsive to operation of said manual switch means.

3,855,781

STEP MOTOR MECHANISM FOR ELECTRONIC TIMEPIECE

Hiroyuki Chihara, and Yoshito Ushiyama, both of Okaya, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 21, 1973, Ser. No. 427,208

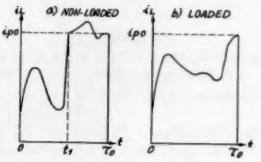
Claims priority, application Japan, Dec. 22, 1972, 47-128923

Int. Cl. G04b *19/24;* **G04c** *3/00;* **H02p** *1/40*

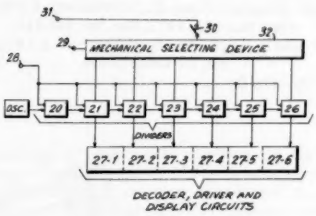
U.S. Cl. 58—4 A **12 Claims**

1. An electronic timepiece having a step motor and comprising a quartz crystal vibrator producing a high frequency

time standard signal; divider circuit means for producing low frequency time signals in response to said high frequency time standard signals; a gear train driven by said step motor and adapted to place the step motor in one of a loaded and unloaded conditions; load detection means for detecting the condition of the step motor and supplying a signal corresponding thereto; and driving and control means intermediate the dividing circuit and the step motor for receiving the low frequency signals from the dividing circuit and applying same to the step motor for driving same, the signals applied to the step motor being controlled by application of the load detection signal to the driving and control circuit means.

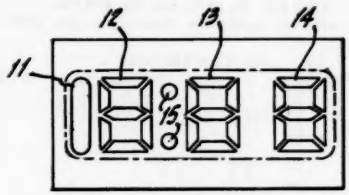


3,855,782
TIME-CORRECTING DEVICE FOR ELECTRONIC TIMEPIECES
Izuhiko Nishimura, and Toshiaki Ogata, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan
Filed Sept. 7, 1972, Ser. No. 287,202
Claims priority, application Japan, Sept. 9, 1971, 46-69297
Int. Cl. G04c *3/00*; **G04b** *27/00*
U.S. Cl. 58—23 R **6 Claims**



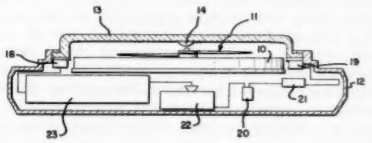
1. An electronic timepiece comprising oscillator circuit means for producing a high-frequency time standard signal; multi-stage frequency divider circuit means for sequentially dividing said high-frequency time standard signal and producing low-frequency timekeeping signals at a selected group of said stages; display means including a plurality of display elements for the digital display of time; means for driving each of said display elements in response to one of said timekeeping signals; and time-correcting means including a manually operable selector switch means connected to at least two of the divider stages producing said timekeeping signals for selecting one of said divider stages, and a secondary switch means manually operable independent of said selector switch means for selectively applying a time-correction signal through said selector switch means to the selected divider stage for correcting the display element associated with said selected divider stage.

3,855,783
DIGITAL ELECTRONIC TIMEPIECE
Nunzio A. Luce, Trenton, N.J., assignor to Optel Corporation, South Brunswick Township, N.J.
Filed Apr. 20, 1972, Ser. No. 245,787
Int. Cl. G04c *3/00*
U.S. Cl. 58—50 R **11 Claims**



10. In a digital electronic watch comprising an electro-optical display cell having indicia thereon, a power supply for supplying energy for operation of said display cell and accompanying circuits, a frequency source capable of providing a predetermined output waveform of a given frequency coupled to said power supply, frequency divider circuit means coupled to the output of said frequency source for generating lower frequencies, as compared to said given frequency, timekeeping circuit means coupled to the output of said divider means and display driver circuit means the input of which is coupled to said timekeeping means and the output of which is coupled to said display cell, the improvement comprising means responsive to one of said lower frequencies for providing at an output thereof a frequency of one cycle per second, bidirectional switching means including a bidirectional switch and an inverter coupled across an element of said switch, said switching means responsive to said one cycle per second signal to provide at an output of said bidirectional switching means a control signal in accordance with said one cycle per second rate and means coupling the output of said switching means to selected indicia of said display cell for pulsing said selected indicia at a rate determined by said one cycle per second signal.

3,855,784
ILLUMINATED TIME PIECE
Donald M. Foellner, 201 Swarthmore Ave., Folsom, Pa. 19081
Filed July 30, 1973, Ser. No. 383,989
Int. Cl. G04b *19/30*
U.S. Cl. 58—50 R **4 Claims**



1. In a time piece including a movement, a face, a case and a crystal therefor, a bulb for illuminating said face, a battery for energizing said bulb, and an improved position responsive switch means comprising:

first and second gravity actuated switches connected in series, and

said first and second gravity actuated switches being positioned orthogonal to one another so that both switches are closed only when said time piece is substantially vertically oriented in a reading position, said position responsive switch means being located within said watch casing and connected between said battery said bulb to

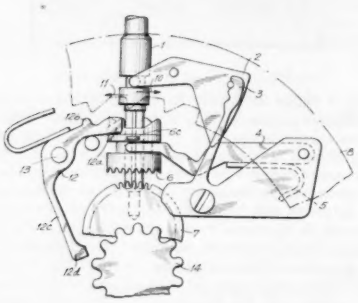
selectively energize said bulb when said time piece is substantially vertically oriented in said reading position.

3,855,785

CALENDAR CORRECTING DEVICE FOR TIMEPIECE

Kenichi Ushikoshi, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 26, 1973, Ser. No. 428,142
Claims priority, application Japan, Dec. 27, 1972, 47-481626
Int. Cl. G04b *19/24*
U.S. Cl. 58—58 3 Claims



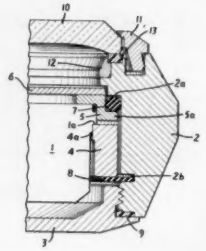
1. In a calendar watch having a rotatable winding stem selectively axially displaceable into plural predetermined positions, a rotatable date wheel and a rotatable daily star, the improvement comprising discrete first and second means for independently operatively connecting, respectively, said winding stem with said date wheel and said daily star in one of said plural predetermined positions of said winding stem for selective consecutive rotation of said date wheel in response to a rotation of said winding stem in one direction, and selective intermittent rotation of said daily star in response to a rotation of said winding stem in said other direction, said second means for operatively connecting said winding stem with said daily star including a lever means mounted for pivoting into operative intermittent engagement with said daily star for rotatively displacing said daily star in response to said rotation of said winding stem in said other direction, pivoting means arranged on said winding stem for fixed rotation therewith, said pivoting means being intermittently engageable to said lever means when said winding stem is displaced at one of said plural predetermined positions, said pivoting means being operatively intermittently engageable to said lever means for pivoting said lever means between a first position and a second position in response to a rotation of said displaced winding stem in said other direction for the rotative displacement of said daily star, said pivoting means being inoperative for pivoting said lever means between said first and second positions for thereby rotatively displacing said daily star when said displaced winding stem is rotated in said one direction, biasing means operatively connected to said lever means for normally biasing said lever means into said first position, and a stopper for supportively stopping said lever means in said first position, said biasing means having a torque which is overcome by an operative engagement of said pivoting means to said lever means for thereby pivoting said lever means from said first position to said second position, said biasing means being operable for returning said lever means from said second position to said first position at the end of an operative engagement of said pivoting means to said lever means.

3,855,786

IMPACT-PROOF WATCHCASE

Eiji Yamamoto, Matsudo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Dec. 21, 1973, Ser. No. 427,331
Claims priority, application Japan, Dec. 26, 1973, 48-410
Int. Cl. G04b *37/04*
U.S. Cl. 58—88 C 11 Claims



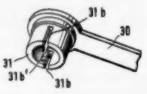
1. An impact-proof watchcase comprising a dial, a backcover, a watchcase band therebetween having an internal peripheral downwardly facing shoulder, inner ring means within said watchcase band, watchworks disposed within said inner ring means mounted thereon, a first shock-absorbing resilient member coactive with said watchcase band shoulder resiliently absorbing vibrations of said watchworks in three dimensions, and a second shock-absorbing resilient member of considerable stiffness radially of the watchcase, bearing against a portion of the watchcase which is at least close to the backcover for resiliently supporting said inner ring means relative to said watchcase band for absorbing three dimensional vibrations of said watchworks.

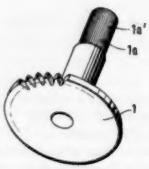
3,855,787

ATTACHMENT FOR THE HANDS OF A WATCH

Friedrich Assmus, Schramberg, Germany, assignor to Firma Gebruder Junghans G.m.b.H., Schramberg, Germany

Filed Mar. 23, 1973, Ser. No. 344,148
Claims priority, application Germany, Apr. 1, 1972, 125361
Int. Cl. G04b *19/00*
U.S. Cl. 58—126 D 4 Claims





1. In a timepiece having a driven gear mechanism; and a hand drivingly mounted on said gear mechanism; said hand including wall means defining an aperture; and said gear mechanism including a plastic shaft firmly grippingly receiving the aperture of the hand; the improvement wherein:

said plastic shaft includes a plurality of radially extending and longitudinally oriented projections firmly gripping said aperture-defining wall means to effect a firm gripping engagement between said plastic shaft and said hand while affording alignment turning of said hand about said plastic shaft; said wall means including at least one slit opening into said aperture; an axially extending edge of said slit defining a projection engageable with said projections on said plastic portion.

3,855,788

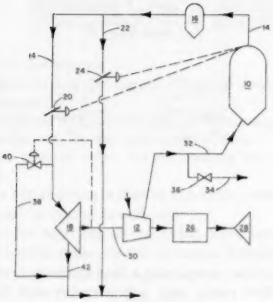
APPARATUS FOR AND A METHOD OF OPERATING POWER RECOVERY EQUIPMENT

Leonard P. Damratowski, Monroeville, Pa., assignor to Carrier Corporation, Syracuse, N.Y.

Continuation of Ser. No. 255,421, May 22, 1972, abandoned, which is a division of Ser. No. 110,987, Jan. 29, 1971, Pat. No. 3,777,486. This application Sept. 27, 1973, Ser. No. 401,490

Int. Cl. F02c *9/02*

U.S. Cl. 60—39.03 **1 Claim**



1. The method of regulating the operation of a power recovery turbine utilizing as a source of energy substantially particle-free gaseous products of combustion formed in a catalyst regenerator serving a fluid catalytic cracking plant which comprises the steps of:

a. directing the flow of gaseous products of combustion from the regenerator to the inlet of the turbine through a main conduit having a relatively large diameter to accommodate the volume of gaseous flow emanating from the regenerator,

b. providing a path of flow through a first by-pass conduit arranged in parallel with a portion of the main conduit whereby a variable volume of gaseous flow may be directed around the turbine,

c. varying passage of gaseous products in the two conduits through actuation of flow control valves disposed therein,

d. providing a path of flow through a second by-pass conduit communicating with the main conduit between the valve regulating flow therein and the inlet of the turbine to also direct gas around the turbine, and

e. regulating the flow of gas in the by-pass conduits, and varying the regulating of the gas flow in the by-pass conduits such that flow in said second by-pass conduit may occur more rapidly than flow in said first by-pass conduit.

3,855,789

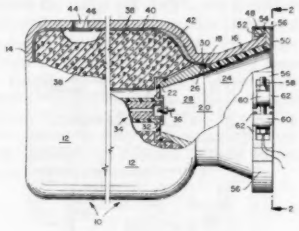
EXPLOSIVE COUPLING ASSEMBLY

Harold M. Platzek, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 5, 1968, Ser. No. 720,438

Int. Cl. F02k *9/06*

U.S. Cl. 60—225 **2 Claims**



1. In a rocket launched-ram-jet sustained motor having a common combustion chamber with a ram jet nozzle of relative large throat diameter and a rocket nozzle of relatively small throat diameter, the rocket nozzle being sealingly disposed within the ram jet nozzle and adapted to be axially ejected therefrom by combustion chamber pressure at termination of rocket thrust, the motor having means for admitting ram air thereafter, the improvements in combination, comprising;

a. a circular outwardly extending flange on the rear end of the ram jet nozzle having a circular outwardly and rearwardly tapered surface on its forward side,

b. a plurality of equi-angularly spaced arcuate segments for preventing ejection of the rocket nozzle,

c. each segment having a surface conforming to and engaging said tapered surface,

d. each segment having an inwardly directed flange with a portion thereof in engagement with the rear face of the rocket nozzle for preventing its ejection, and

e. a band encircling the segments having ends connected by at least one explosive bolt,

f. the construction and arrangement being such that upon explosive bolt actuation the band releases from the segments and combustion chamber pressure moves the rocket nozzle axially rearwardly, forcing the segments radially outwardly and permitting ejection of the rocket nozzle.

3,855,790

DEVICE FOR DRIVING TWO PARTS IN ROTATION

Michel Rist, Boulogne/S/Seine, France, assignor to Societe Anonyme Francaise Du Ferodo, Paris, France

Filed June 15, 1973, Ser. No. 370,234

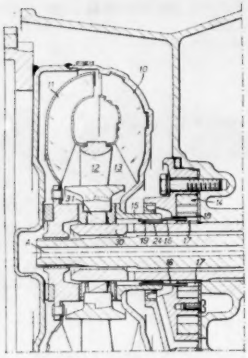
Claims priority, application France, June 20, 1972, 72.22124

Int. Cl. F16h *41/04*

U.S. Cl. 60—361 **10 Claims**

1. A device for driving two members in rotation, one with respect to the other, in which a first of said members comprises a sleeve having at least one projecting tenon extending substantially in the prolongation of the wall of said sleeve and adapted to co-operate with the second said member, and in which said device is constituted as a member separate from the sleeve and fixed rigidly on said sleeve by engagement means comprising, on the one hand at least one recess formed in said sleeve, said tenon being inserted in said recess with the application against each other of bearing surfaces adapted to

retain said tenon axially and tangentially, and on the other hand a ring concentric with said sleeve and engaged in contact



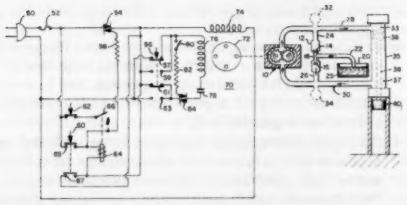
both with said sleeve and said tenon, in order to retain said tenon radially.

3,855,791

REVERSIBLE MOTOR HYDRAULIC CONTROL SYSTEM

Mario Quinto, 70 Dannell Dr., Stamford, Conn. 06905

Filed Aug. 24, 1973, Ser. No. 391,234
Int. Cl. F15b *1/02, 15/18*
U.S. Cl. 60—380 **7 Claims**



1. A reversible motor-driven hydraulic control system comprising

a. a reversible pump,

b. a reservoir containing a source of fluid,

c. an actuator cylinder having a hydraulic piston movable in two directions therein coupled to said reversible pump,

d. a compensator means coupled to said reservoir and between said pump and said actuator cylinder for equalizing fluid displacement in said actuator cylinder on the movement of said piston therein and replenishment of fluid to the system,

e. a reversible motor coupled to said reversible pump having a stalled torque value substantially equivalent to the torque required to produce a predetermined hydraulic pressure under load conditions on the piston in said actuator cylinder, and

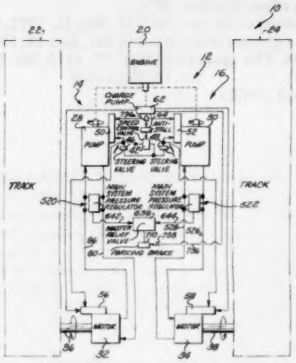
f. momentary switch means actuating said motor for rotation in one direction until the hydraulic pressure reaches the stalled torque value thereby producing a starting torque in the reversed direction and reversing the direction of rotation of said motor and the reversible pump driven thereby.

3,855,792

HYDROSTATIC TRANSMISSION DRIVE SYSTEM

Edward J. Bojas, and Harold R. Ward, both of Marshall, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 248,685, April 28, 1972, Pat. No. 3,795,109. This application Nov. 16, 1973, Ser. No. 416,435
Int. Cl. F16h *39/46*
U.S. Cl. 60—421 **19 Claims**

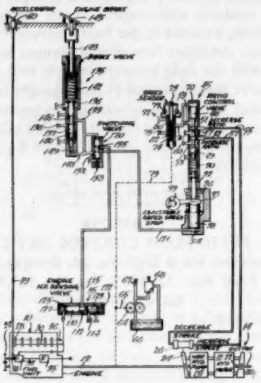


1. An apparatus comprising a first hydrostatic transmission including a first pump unit, a first motor unit, first conduit means for conducting fluid from said pump unit to said motor unit during operation of said first hydrostatic transmission in a forward direction, second conduit means for conducting fluid from said motor unit to said pump unit during operation of said first hydrostatic transmission in the reverse direction, third conduit means for conducting fluid from said first conduit means during operation of said first hydrostatic transmission in the forward direction and for conducting fluid from said second conduit means during operation of said first hydrostatic transmission in the reverse direction, first relief valve means operable between a closed condition blocking fluid flow through said third conduit means and an open condition enabling fluid to flow through said third conduit means, a second hydrostatic transmission including a second pump unit, a second motor unit, fourth conduit means for conducting fluid from said second pump unit to said second motor unit during operation of said second hydrostatic transmission in a forward direction, fifth conduit means for conducting fluid from said second motor unit to said second pump unit during operation of said second hydrostatic transmission in the reverse direction, sixth conduit means for conducting fluid from said fourth conduit means during operation of said second hydrostatic transmission in the forward direction and for conducting fluid from said fifth conduit means during operation of said second hydrostatic transmission in the reverse direction, second relief valve means operable between a closed condition blocking fluid flow through said sixth conduit means and an open position enabling fluid to flow through said sixth conduit means and a common relief valve pilot control for controlling the opening of both said first and second relief valve means.

3,855,793
TRANSMISSION RATIO CONTROL SYSTEM

Frederic W. Pollman, Ames; David W. Reynolds, Huxley; William A. Ross, and George A. Schauer, both of Ames, all of Iowa, assignors to Sundstrand Corporation, Rockford, Ill.

Filed Apr. 19, 1973, Ser. No. 352,660
Int. Cl. F16h *39/46*
U.S. Cl. 60—431 **29 Claims**

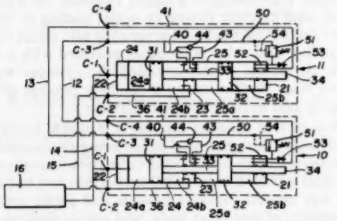


1. A drive, comprising,
a. an engine having fuel supply means for controlling engine horsepower,
b. a hydrostatic transmission driven by the engine including means for varying the transmission ratio,
c. a ratio control valve for controlling the ratio varying means,
d. means for applying a bias to the ratio control valve porportional to engine speed, and
e. means for applying an opposing fluid bias to the ratio control valve proportional to engine horsepower.

3,855,794
SYNCHRONIZED PISTON ASSEMBLY

Kenneth H. Meyer, and William E. Heese, both of Akron, Ohio, assignors to Hydrapower Inc., Wadsworth, Ohio

Continuation of Ser. No. 256,599, May 24, 1972, abandoned. This application Aug. 1, 1973, Ser. No. 384,718
Int. Cl. F15b *11/22*
U.S. Cl. 60—546 **5 Claims**

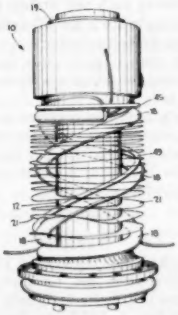


1. A synchronized piston assembly comprising at least two cylinder units each comprising: a drive cylinder having ports adapted for connection with a fluid power control source and a synchronizing cylinder having ports which are cross-connected with respect to the ports of the other synchronizing cylinder; and a piston unit in each cylinder unit having interconnected drive and synchronizing pistons axially reciprocable in the respective cylinders whereby hydraulic actuation of said drive pistons in the respective drive cylinders actuates the respective synchronizing pistons in the respective synchronizing cylinders so that fluid displaced from one end of each synchronizing cylinder to the other end of the other synchronizing cylinder synchronizes the actuation of said drive pistons despite unequal loads on said piston units; each cylinder unit having relief valve means operative to intercommunicate the synchronizing circuit chambers on opposite sides of the synchronizing piston for fluid pressure equalization therein and for continued movement thereof and its drive piston to the end of one stroke in the event that the other piston unit previously reaches the end of one stroke, and to intercommunicate the synchronizing chambers on opposite sides of the synchronizing piston of said other piston unit to equalize fluid pressures therein each relief valve means being opened by pilot pressure buildup in its decreasing synchronizing chamber during such continued movement of its piston unit to the end of its retract stroke; said pilot pressure opening said other relief valve means for fluid pressure equalization of the synchronizing chambers on opposite sides of the synchronizing piston in said other piston unit.

3,855,795
HEAT ENGINE

Jack E. Noble; Peter Riggle, both of Benton City; Stuart G. Emigh, and William R. Martini, both of Richland, all of Wash., assignors to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed Jan. 30, 1973, Ser. No. 328,075
Int. Cl. F03g *7/06*
U.S. Cl. 60—524 **6 Claims**



1. In a heat engine operating on a regenerative cycle and having a cylinder, the end portions of which define respectively a hot chamber and a cold chamber, the improvement comprising a temperature control heat pipe located on the outer surface of the cylinder, said heat pipe containing a working fluid and an inert gas and being conductive over its entire length to conduct heat away from the hot end of the engine when an overtemperature condition is reached and nonconductive at acceptable operating temperatures.

3,855,796
APPARATUS FOR LIFTING FLASKS AND MOLDS

Lester Charles Young, Cleveland, Ohio, assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 13, 1972, Ser. No. 314,892
Int. Cl. F15b *7/00*
U.S. Cl. 60—547 **4 Claims**

1. Apparatus for lifting a mold relative to a support member, comprising in combination:
a. plural lifting means each including a lift cylinder stationary relative to said support member and a lift piston

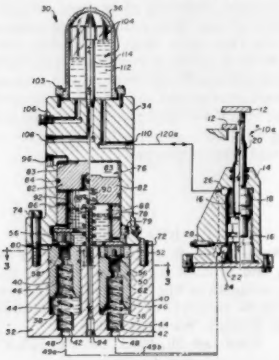
movable therein for actuation between lowered and raised positions for lifting said mold when actuated to said raised position;

b. means biasing each of said lift piston to said lowered position; and

means for actuating said lift pistons in unison to said raised position comprising:

i. a liquid reservoir,

ii. plural branch cylinders each in liquid communication with a different one of said plural lift cylinders below said lift piston in its lowered position,



iii. piston means in each said branch cylinder having a liquid passageway extending therethrough and selectively in liquid communication with said reservoir,

iv. means biasing each said branch piston to a reference position remote from the lift cylinder communicating end of said branch cylinder;

v. normally open poppet valve means with each said branch piston for selectively closing said passage therethrough, and

vi. selectively actuable pressure responsive means for actuating said poppet valve means to the closed state and for moving said branch pistons only in unison toward the lift cylinder communicating end of said branch cylinder.

3,855,797

HYDRAULIC MASTER CYLINDER

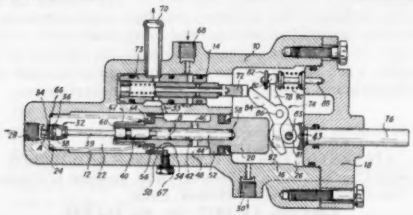
Guy Papiau, Arnouville les Gonesse, France. Assignee: Societe Anonyme D.E.A., Paris, France

Filed Dec. 6, 1973, Ser. No. 422,216

Claims priority, application France, Dec. 18, 1972, 72.45051

Int. Cl. F15b *7/00*

U.S. Cl. 60—547 **5 Claims**



1. In a hydraulic brake actuating device:

a housing defining a bore therewithin;

a piston slidably mounted in said bore and cooperating with opposite ends of the latter to define a pair of pressure chambers;

an outlet communicating with one of said chambers

valve means shiftable from a condition venting the other chamber to a fluid reservoir to a position communicating said other chamber with a source of fluid pressure to thereby shift said piston to develop fluid pressure in said one chamber; and

a pressure differential responsive plunger having a pair of opposed faces slidably mounted on said piston, and resilient means yieldably urging said plunger to a predetermined position with respect to the piston, one of said faces being exposed to the fluid pressure level in said one chamber, the other face of said plunger being communicated with the fluid pressure level in said resevoir; and

cut-off valve means carried by said plunger for cooperation with said outlet to terminate communication therethrough when the fluid pressure level in said one chamber drops below a predetermined level for a given movement of the piston.

3,855,798

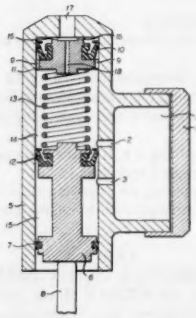
FLUID FLOW CONTROL DEVICE

Luciano Spairani, Via B Gigli No. 24, Bologna, Italy

Filed Mar. 22, 1973, Ser. No. 343,712

Int. Cl. F15b *7/08*

U.S. Cl. 60—585 **6 Claims**



1. A control device for the actuation of a hydraulic load, comprising:

a cylinder provided with a supply chamber for a hydraulic fluid, said cylinder having an outlet leading to the load;

a valve body in said cylinder separating said outlet from said chamber, said valve body being provided with a deformable peripheral gasket engaging the cylinder wall, said valve body further having a capillary passage giving access to said outlet from said chamber;

a piston in said cylinder forming a movable boundary for said supply chamber, said piston being displaceable by an extraneous force toward said valve body whereby hydraulic fluid is forced from said chamber into said outlet partly by way of said capillary passage and partly around the periphery of said valve body, said gasket yielding to fluid pressure from said chamber to give passage to said fluid; and

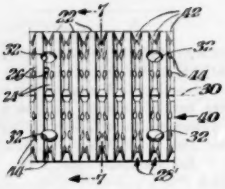
restoring means engaging said piston for returning same to an initial position remote from said valve body upon cessation of said extraneous force, thereby drawing fluid from said outlet back into said chamber by way of said capillary passage only, said gasket substantially preventing any return flow around the periphery of said valve body.

3,855,799

RIGID CORRUGATED TUBING

Lawrence L. Martin, Iowa City, Iowa; Ronald C. Martin, Waterville, Ohio, and Marty E. Sixt, Iowa City, Iowa, assignors to Advanced Drainage Systems, Inc., Columbus, Ohio

Filed Jan. 17, 1973, Ser. No. 324,308
Int. Cl. E02b 11/00
U.S. Cl. 61—11 6 Claims



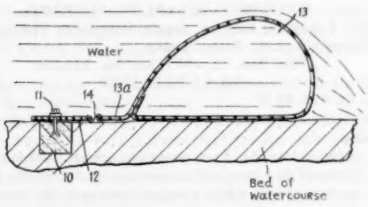
1. A longitudinally oriented rigid corrugated tube comprising alternating substantially flat peak and flat valley walls with steep interconnecting walls extending between the peak and valley walls, and stiffening rib structure connected between at least some of the valley and interconnecting walls, one form of the rib structure extending to the flat peak walls and between adjacent interconnecting walls across the valley wall therebetween for preventing flexing of the tube, and another form of the stiffening rib structure including a plurality of individual external ribs in the form of buttresses spaced from one another, each of the buttresses connected between a valley wall and one of the interconnecting walls adjacent thereto and extending up to the flat peak wall.

3,855,800

INFLATABLE BARRIERS FOR WATERCOURSES

Jean-Victor Ganzinotti, Brive, France, assignor to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes, Colombes, France

Filed Oct. 18, 1973, Ser. No. 407,502
Claims priority, application France, Oct. 18, 1972, 72.36917; Oct. 18, 1972, 72.36918; Oct. 18, 1972, 72.36919
Int. Cl. E02b 7/04
U.S. Cl. 61—29 10 Claims



1. In inflatable barrier means for retaining water in a watercourse, comprising at least one inflatable enclosure secured to an element anchored directly or indirectly in the watercourse and constructed in such a fashion as to prevent erosion, the improvement which consists in that the means for anchoring the enclosure in relation to the bed of the watercourse incorporates an anchoring strip of supple material securable to said bed and having a free extremity provided with one or more means for removably connecting said enclosure to said anchoring strip.

3,855,801

TUNNEL STRUCTURE

Jean P. Bernold, Walenstadt, Switzerland, assignor to Hans Walter Pfeiffer, a part interest

Division of Ser. No. 170,770, Aug. 11, 1971, Pat. No. 3,751,929, which is a division of Ser. No. 798,747, Feb. 12, 1969, Pat. No. 3,601,945. This application Mar. 15, 1973, Ser. No. 341,600
Int. Cl. E01g 5/00
U.S. Cl. 61—45 R 5 Claims

1. A tunnel structure or the like having a predetermined internal cross section for permanent installation in a tunnel excavation having a workface and being driven beneath the ground in a predetermined direction, said tunnel structure or the like, comprising

A. a plurality of structural panel units arranged in end overlapping manner as a permanent formwork having a cross section definitive of said predetermined internal tunnel cross section;

B. each of said structural panel units including

a. a series of parallel, longitudinal corrugations, the walls of which define crests lying in upper planes and troughs lying in lower planes, said corrugations being transverse to the direction of driving of said tunnel;

b. a series of bandlike pocket forming elements derived from portions of said crests between pairs of transverse cuts in said crests at predetermined intervals along said corrugations;

c. said bandlike pocket forming elements being of nonuniform width and being depressed from the plane of said crests into a pocket forming plane bridging said corrugation;

d. a series of longitudinally extending pockets having spaced upper wall portions defined by said crests and lower wall portions spaced alternately of said crests defined by said bandlike elements;

e. said pocket forming elements being narrowest at the longitudinal centerline of said pockets and widest at the opposite sides of said pockets;

f. said panel, in longitudinal elevation, thereby having rows of alternating wedge-shaped crest portions and wedge-shaped pocket forming elements separated by wedge-shaped gaps;

g. whereby said panel is readily matable with another panel of identical configuration by nesting therewith, said nested panels forming composite longitudinal pockets, the upper walls of which are defined only by said crest portions of the underlying nested panel and the lower walls of which are defined only by said pocket forming elements of said overlying panel;

C. rodlike members extending through said pockets to connect overlapped, nested end portions of said structural panel units;

D. said permanent formwork being inwardly spaced from walls of said excavation and defining a predetermined gap therebetween;

E. a concrete lining tightly filling said gap and pockets of said panel units, said lining comprising consecutively

installed sections formed by introduction of concrete behind said formwork and vibration of said concrete in said gap to bond said lining to the walls of said excavation and said panel units;

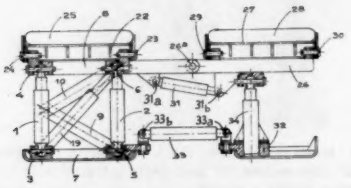
F. front formwork means disposed in each section of lining of the tunnel structure at the ends of the structural panel units which are forwardmost in said direction of driving to maintain said ends free of concrete, thereby accommodating connection by rodlike members with the rear ends of the structural panel units of the next section of said formwork and said lining to be installed.

3,855,802

WALKING SUPPORTING PIER FOR COAL MINES

Georges Alacchi, 9 ter Cours Fauriel, Saint-Etienne, France

Filed Sept. 12, 1973, Ser. No. 396,568
Int. Cl. E21d *15/44*
U.S. Cl. 61—45 D **5 Claims**



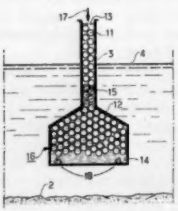
1. A walking supporting pier for coalmines comprising two props mounted on a common lower frame on the wall and supporting a common upper frame extended by a front shield which is pivotally connected to it and which itself supports a cowl, distinguished by the fact that said upper frame and said lower frame are connected by two sets of rods each consisting of two pivotally interconnected rods, one of which is pivotally connected to the upper frame and the other pivotally connected to the lower frame, the axes of the three pivotal connections of one set being parallel to one another and perpendicular to the longitudinal median plane of the pier, whilst the three axes of the pivotal connections of one of the sets coincide respectively with the three axes of the other set.

3,855,803

METHOD OF SUBMERGING A HOLLOW STRUCTURE

Roger Lacroix, Sceaux, France, assignor to Sea Tank Co., Paris, France

Filed Feb. 15, 1973, Ser. No. 332,845
Claims priority, application France, Feb. 15, 1972, 72.05008
Int. Cl. E02d *29/00, 23/08*
U.S. Cl. 61—46.5 **20 Claims**



1. A method of submerging a hollow structure in water comprising the steps of

1. inserting in the structure a plurality of floats which are substantially incompressible and which have a density less than unity, said plurality of floats being large enough in number so that said floats extend from a first inner wall of said structure to a second inner wall of said structure opposite to said first inner wall in contact with each other and with said walls, said floats being of a shape or shapes which leaves interconnecting volumes between said floats;

2. progressively filling the structure with water while keeping the interior of the hollow structure in communication with the outside atmosphere; and finally

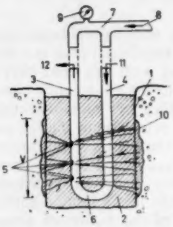
3. removing the floats at the end of the submersion.

3,855,804

APPARATUS AND METHOD FOR DISTENDING THE DISTENSIBLE BODY OF AN EARTH ANCHOR

Thomas Herbst, Munich, and Klemens Finsterwalder, Socking near Starnberg, both of Germany, assignors to Dyckerhoff & Widmmann Aktiengesellschaft, Munich, Germany

Filed Jan. 2, 1973, Ser. No. 320,291
Int. Cl. E02d *5/62, 5/80*
U.S. Cl. 61—53.6 **3 Claims**



1. Arrangement for distending in multiple sections of the distending body of an earth anchor in sticky soil, comprising conveying conduit means having one end embedded in the distending body below earth level and an air side end extending above the distending body for supplying cement slurry or the like to the distending body below the earth level, means above the earth level for supplying cement slurry to said conduit means, said embedded ends of said conduit means having openings for emitting the cement slurry constituting the distention material, each said section comprising two distention conduits connected at said one embedded end, and one-way valve means connecting said distention conduits.

3,855,805

GATE SELF-ADVANCING SUPPORT

Shigeo Nakajima, Kushiro, Japan, assignor to Taiheiyo Coal Mining Co., Ltd., Tokyo, Japan

Filed Feb. 12, 1973, Ser. No. 332,039
Int. Cl. E21d *23/00*
U.S. Cl. 61—45 D **2 Claims**

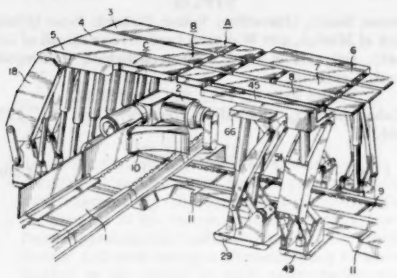
1. A moveable roof support arrangement for mining comprising:

a. a face conveyor (1) to convey to a front portion thereof, material in a longitudinal direction between the far and near conveyor sides, a charge conveyor (9) having one end positioned crosswise beneath said front portion, said one end extending over to beneath said face conveyor far side and a separator (10) for changing the direction of travel of conveyed material and discharging said material from said face conveyor (1) onto said charge conveyor (9);

b. a main skid (11) under said charge conveyor with a central elongated hollow portion to house said charge conveyor (9) so that said portion of the charge conveyor under said face conveyor (1) is completely housed within said hollow portion and does not contact said face con-

veyor and rear and front shifter brackets (**12, 39**) on said main skid;

c. at least one rear roof support assembly having telescoping shifter means (**13**) connected to said rear shifter brackets (**12**) a shifter skid (**20**) connected to said telescoping shifter means (**13**), links (**21**) on said shifter skid (**20**), a rear arch frame (**18**) with a lower end movably connected to said links (**21**) a roof bar (**16**) having an outer end supported and coupled to said rear arch frame (**18**) and props (**19**) also supporting said roof bar (**16**); and,



d. at least one front roof support assembly having front telescoping shifter means (**30**) connected to said front shifter bracket (**39**), a front skid (**29**) connected to said front shifter means (**39**) front links (**33**) on said front skid (**29**) front arch frames (**31**) with a lower end movably connected to said front links (**33**), a front roof bar (**26**) having an outer end connected to said front arch frames (**31**), and a center roof bar (**17**) pivotally connected said rear and front roof bars (**16, 26**) whereby said face conveyor (**1**) and charge conveyor (**9**) are held by said main skid (**11**) between said front and rear roof support assemblies and said roof support can be moved by said shifters.

3,855,806

APPARATUS FOR INSTALLING AND MAINTAINING SUBAQUATIC PETROL TANKS

Louis G. Le Therisien, Paris, France, assignor to Subsea Equipment Associates Limited (Seal), Hamilton, Bermuda

Filed June 28, 1972, Ser. No. 266,920

Claims priority, application France, June 28, 1971, 71.23429

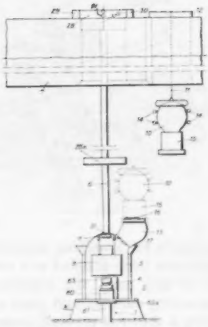
Int. Cl. E21b *7/12*

U.S. Cl. 61—69 **15 Claims**

1. An apparatus for installing and maintaining equipment submerged in a body of water in cooperation with a service unit and a work crew transfer chamber, said apparatus comprising:

1. a generally horizontal base fixed permanently to the floor of said body of water;
2. a generally cup-shaped workbell resting removably on said horizontal base in a seal-tight manner, said workbell being open on the side thereof adjacent to said horizontal base so that said horizontal base and said workbell together define an interior space which is isolated from said body of water;
3. a control chamber mounted on said workbell and having:
   a. a first water-tight door connecting said control chamber to said interior space;
   b. a second water-tight door adapted to connect said control chamber to the transfer chamber;
   c. means for allowing water to enter into said interior space;
   d. means for pumping water from said interior space;
   e. means for monitoring the composition of a gaseous atmosphere contained within said interior space; and
   f. a first means for introducing a first gas into said interior space,

whereby a work crew can enter said control chamber either from the transfer chamber through said second water-tight door or from said interior space through said first



watertight door, and can, while in said control chamber with said first water-tight door closed, control the atmosphere in said interior space; and

4. means for coupling the service unit to said workbell for lowering and raising said workbell to and from the position in which it rests on said horizontal base.

3,855,807

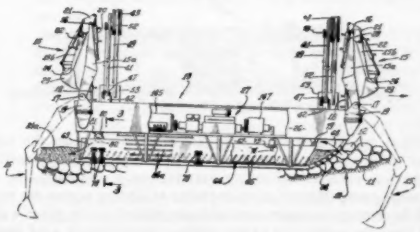
PIPE TRANSPORTING AND LAYING VEHICLE AND METHOD

Donovan B. Grable, Long Beach, Calif., assignor to Wasteland Reclamation Corp., Long Beach; Bill C. Laney, Torrance and William W. Haefliger, San Marino, all of, Calif.

Continuation-in-part of Ser. No. 323,769, Jan. 15, 1973, Pat. No. 3,761,132. This application July 18, 1973, Ser. No. 380,268

Int. Cl. F16l *1/00*; **E02b** *1/00*; **B60f** *3/00*

U.S. Cl. 61—72.1 **14 Claims**



1. In a carrier vehicle movable over terrain and water,

a. a floatable hull to float the vehicle in a body of water, and

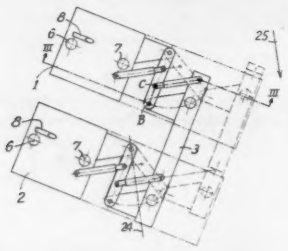
b. articulated legs carried by the vehicle and connected therewith to engage the terrain for lifting and advancing the vehicle thereover, said legs including terminal backhoes engageable with the terrain.

3,855,808

SHIFTING SYSTEM FOR WALKING SUPPORTS

Georges Alacchi, 9 ter cours Fauriel, Saint-Etienne, France (42100)

Filed Sept. 12, 1973, Ser. No. 396,548
Int. Cl. E21d 15/44
U.S. Cl. 61—45 D 4 Claims



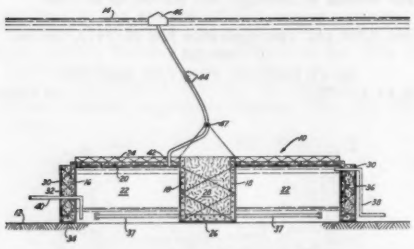
1. A shifting system for a walking support of the type comprising two successive piers coupled to a common shift beam situated ahead of said piers, the improvement comprising means, for connecting each of said piers to said beam, said means comprising a shift rod pivotally connected on the one hand to the lowerframe of said pier and on the other hand to said shift beam, and two shift jacks of which the first is pivotally connected on the one hand to said lower frame and on the other hand to said rod, whereas the second is pivotally connected on the one hand to said shift beam and on the otherhand to said shift rod.

3,855,809

UNDERWATER OIL STORAGE TANK AND METHOD OF SUBMERGING SAME

Randolph E. Westling, Houston, Tex., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 152,715, June 14, 1971, abandoned. This application Aug. 3, 1972, Ser. No. 277,698
Int. Cl. E02b 17/00; B65d 89/10
U.S. Cl. 61—46.5 7 Claims



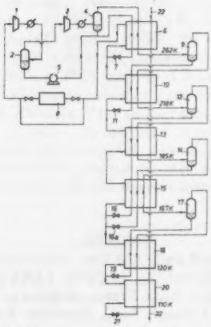
1. A submerged storage tank for installation on the sea bottom at offshore locations to store oil having a lower density than sea water comprising a vertical outer wall enclosing a storage compartment, a top member extending across the top of the storage compartment and connected to the outer wall to close the upper end of the storage compartment, said storage compartment being open at its lower end, a retainer wall surrounding the vertical wall and spaced therefrom to cooperate with the vertical wall in defining an upwardly opening ballast chamber between the retainer wall and the outer wall, a bottom member connected to the lower end of the vertical wall and to the retainer wall closing the lower end of the ballast chamber, said bottom member positioned and adapted to rest on the sea bottom when the tank is sunk onto the offshore site, a sea water exchange line extending from outside of the retainer wall into the storage compartment and opening into the lower part of the storage compartment, an oil inlet line opening into the upper part of the storage compartment, and an oil delivery line extending from the top of the storage compartment upwardly to the water surface.

3,855,810

ONE FLOW CASCADE CYCLE WITH BUFFER VOLUME BYPASS

Johannes Simon, Oberalting; Volker Etzbach; Peter Grimm, both of Munich, and Wolfgang Ford, Grunwald, all of Germany, assignors to Linde Aktiengesellschaft, Hollriegelskreuth, Germany

Filed Feb. 12, 1973, Ser. No. 332,022
Claims priority, application Germany, Feb. 11, 1972, 2206620
Int. Cl. F25j 3/00
U.S. Cl. 62—9 2 Claims



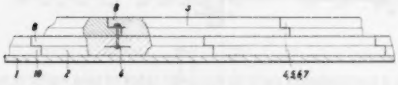
1. In a process for the liquefaction of natural gas by a closed "one flow cascade" refrigeration cycle operated with a refrigerant mixture, wherein the refrigerant mixture is conducted through a hermetically sealed cycle comprising a cycle compressor, a low-pressure cycle section and a high-pressure cycle section, and wherein when the cycle compressor is cut off, the pressure in the low-pressure cycle section would build up to a pressure above the maximum design pressure of said low-pressure section in the absence of a pressure relief valve,

the improvement comprising introducing sufficient buffer volume in said low-pressure section when the cycle compressor is cut off, to compensate for said build-up in pressure, so said refrigerant mixture does not escape from said cycle, and so that pressure relief valves venting to the atmosphere are not required, said buffer volume being bypassed during normal operation of the cycle compressor.

3,855,811
INSULATION FOR LIQUID GAS CONTAINERS, ESPECIALLY SPHERICAL CONTAINERS

Irmhild Sauerbrunn, Altenbach/Odw., and Rudolf Bellemann, Rot, both of Germany, assignors to Rheinhold & Mahba GmbH, Anlage, Germany

Filed Jan. 31, 1973, Ser. No. 328,397
Claims priority, application Germany, July 6, 1972, 2233332
Int. Cl. F17c 3/04
U.S. Cl. 62—45 8 Claims



1. Insulation for liquid gas containers comprising:

a plurality of molded inner foamed synthetic insulating panels each having rabbeted edges, each having a fastening element at the center thereof projecting upwardly from approximately halfway through the thickness thereof and each having a force-accepting element embedded in the center of each panel during molding thereof at approximately half the thickness of said panel; said inner insulating panels being adapted for arrangement on a gas container with each panel being staggered with respect to at least one of the next adjoining panels and interlocking therewith;

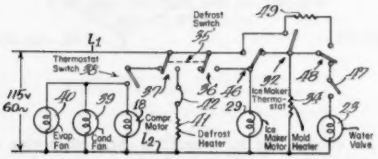
a plurality of outer insulating panels having rabbeted edges; said outer insulating panels being adapted for arrangement on said inner insulating panels with each outer panel being staggered with respect to at least one of the next adjoining outer panels and interlocking therewith and each said outer panel being staggered with respect to said inner panels; and

wherein said fastening elements of said inner panels fit into the rabbeted edges of said outer panels.

3,855,812
DOMESTIC ICE MAKER AND DEFROST TIMER

William J. Linstromberg, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Mar. 21, 1973, Ser. No. 343,281
Int. Cl. F25c 1/00
U.S. Cl. 62—135 10 Claims

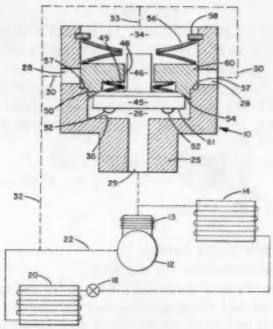


1. In a refrigeration apparatus having cooling means, means for defrosting the cooling means mechanism including means for making ice bodies and means operated by a drive motor for harvesting the ice bodies, and means for causing cyclical operation of the harvesting means irrespective of the making of said ice bodies, control means for controlling the operation of the defrosting means comprising: timing means operated by said mechanism only during operation of the harvesting means for initiating operation of the defrosting means upon operation of said harvesting means a preselected number of cycles; and means for maintaining operation of the defrosting means for a preselected period of time after initiation to effect defrosting of the cooling means.

3,855,813
COMPRESSOR CONTROL FOR REFRIGERATION SYSTEM

Arthur St. Laurent, 240 S. Main St., Minoa, N.Y. 13116

Filed Aug. 1, 1973, Ser. No. 384,774
Int. Cl. F25b 41/00
U.S. Cl. 62—196 2 Claims



1. In a refrigeration unit including a compressor (**12**) with a first heat exchange coil (**14**) joined to the discharge side of said compressor, expansion means (**18**) and a second heat exchange coil (**20**) joined to the suction side of said compressor, the improvement comprising:

a. a combination equalizer and over-pressure control (**10**) having passage means adapted to communicate said compressor discharge side with said compressor suction side bypassing said other components of said unit, said passage means including a first piston-like member (**60**) having a first relief port therethrough, said member when in a first position preventing any flow of fluid through a second relief port (**28**);

b. means for closing said first relief port including a second piston-like member (**45**), said second piston-like member being disposed upstream of said first piston-like member, said first and second members being movable relative to one another;

c. control means including first means (**49**) providing a force to maintain said second member in spaced relationship relative to said first member, said second member moving into sealing abutment with said first member to close said first relief port when fluid pressure acting on said second member exceeds a predetermined value, second means (**56**) providing a force to maintain said first and second members in position relative to said second relief port to prevent any fluid flow therethrough, said first and second members moving jointly at a predetermined over-pressure condition to open said second relief port; and

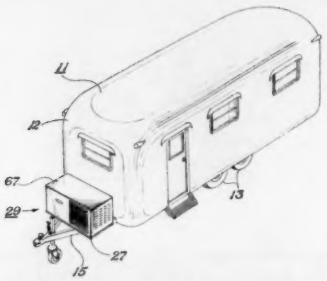
d. said first force supplying means moving said second member relative to said first member when the compressor becomes inoperable thereby opening said first relief port, said second member including abutment means (**52**) to maintain said passage means in an open state when said first relief port is opened to relatively quickly equalize pressures between the discharge side and the suction side of said compressor.

3,855,814

MOBILE HOME ADAPTED FOR EXTERNALLY MOUNTED AIR CONDITIONING UNIT AND UNIT THEREFOR

Marcus P. Eubank, Box 7576, Longview, Tex. 75601

Continuation-in-part of Ser. No. 361,975, May 21, 1973, abandoned. This application Mar. 21, 1974, Ser. No. 453,412
Int. Cl. B60h *3/04*
U.S. Cl. 62—244 **11 Claims**



1. In a mobile home having:
a. a main substructure for support;
b. a tongue on said main substructure for being towed;
c. wheels on said main substructure for mobility;
d. a body on said main substructure and defining a space for living therewithin;
e. a conditioned air distribution means in said body for circulating conditioned air therewithin; and
f. a return air means in said body for returning air that has been circulated; the improvement comprising:
g. an external frame;
h. structural attaching framework for attaching said external frame to said mobile home; said structural attaching framework being pre-formed at a predetermined first location on the exterior of said mobile home and being connected with said main substructure with strength adequate to support said external frame and a predetermined and co-connectable external air conditioning unit;
i. mounting means on said external frame for mounting said external air conditioning unit;
j. a supply duct connected with said conditioned air supply distribution means and terminating in an external supply connection means that is adapted for connection with said external air conditioning unit; and
k. a return duct connected with said return air means and terminating in an external return connection means that is adapted for connection with said external air conditioning unit;

whereby said air conditioning unit may be installed subsequently by the mobile home owner by simply attaching said external frame if not already attached, mounting said air conditioning unit on said external frame via said mounting means and connecting respective inlet and outlet ports of said air conditioning unit with said return and supply connection means without requiring expensive, difficultly obtainable skilled help, such as an air conditioning specialist.

3,855,815

REFRIGERATING APPARATUS

Richard C. Wagner, Darien, Ill., assignor to Hollymatic Corporation, Park Forest, Ill.

Continuation-in-part of Ser. No. 264,133, June 19, 1972, Pat. No. 3,824,806. This application Mar. 8, 1973, Ser. No. 339,395
Int. Cl. F25d *25/04*
U.S. Cl. 62—266 **5 Claims**

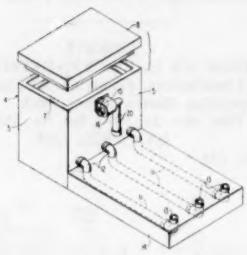
1. Apparatus for refrigerating articles, comprising: means defining a chamber having an entrance and an exit; conveyor means for moving said articles in the chamber in a path from the entrance to the exit; means for introducing a fluid cryogen into said chamber for contact with said articles at an introduction area of the chamber spaced from said entrance; means for withdrawing spent cryogen fluid from said chamber at a withdrawal area of the chamber that is closer to the entrance than is said introduction area; gas recirculation means comprising longitudinally extending baffle means between the top and bottom of said chamber and adjacent said articles path defining a recirculation path on opposite sides of said baffle means; means for withdrawing gas at a first area in said recirculation path from one side of said baffle means and reintroducing the gas at a second area in said recirculation path on the other side of said baffle means; an adjustable first flow control damper means at said first area; an adjustable second flow control damper means at said second area; and a transverse gas barrier in said chamber between said second area and said exit from the chamber.

3,855,816

COOLING DEVICE FOR PORTABLE CHEST

Leslie E. Miller, 7314 Oak Manor Dr., Apt. 703, San Antonio, Tex. 78229

Filed Apr. 10, 1973, Ser. No. 349,747
Int. Cl. F25d *3/12*
U.S. Cl. 62—387 **7 Claims**



1. A cooling unit for a portable chest comprising a box adapted to sit in the chest on the bottom thereof, said box having surrounding walls of insulating material enclosing a chamber adapted to contain a refrigerant, a pipe having an open connection with said chamber through one of the walls adjacent the bottom thereof and extending outwardly therefrom to be disposed in the chest adjacent the bottom thereof for circulating air from the region of the refrigerant into the chest, means forming an opening through said one wall of the box into the chamber from within the chest, and means mounted on said one wall for circulating air through said opening by the refrigerant and for recirculating the air therefrom into the chest, said circulating means including an electrically operated blower mounted on said one wall of the box for causing the recirculation of the air through the opening, a housing connected with the blower, and means within the housing for electrically energizing the blower.

3,855,817

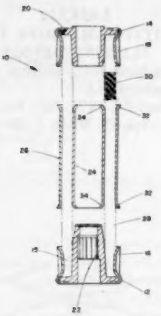
FLEXIBLE SHAFT

Robert E. Stuemky, Elizabeth, and Gene H. George, Denver, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Continuation-in-part of Ser. No. 245,420, April 19, 1972, Pat. No. 3,779,038. This application June 18, 1973, Ser. No. 371,315

Int. Cl. F16d *1/02*

U.S. Cl. 64—2 R 17 Claims



1. A flexible shaft comprising:

a generally tubularly shaped flexible element having two end portions;

end caps affixed to the end portions; and

inner and outer sleeves having lengths less than said flexible element, the sleeve disposed between the end portions and sandwiching a portion of the flexible element in a gripping and radially supporting manner to define at least two unsupported portions of said flexible element adjacent the sleeves.

3,855,818

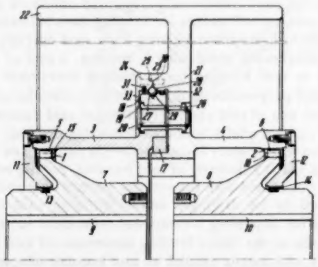
SHEAR PIN SAFETY COUPLING

Johann Hochreuter, Brauhausstrasse 6, D-88 Ansbach, Mittelfranken, Germany

Filed Aug. 25, 1972, Ser. No. 283,809

Int. Cl. F16d *3/56*

U.S. Cl. 64—28 R 10 Claims



1. A shearing pin safety coupling for connecting two shafts, with two halves of the coupling normally held together axially and rotatably by the pins and an angular contact bearing for axially holding together the two halves of the coupling when the pins are destroyed, said bearing including an annular projection adapted to rotate with one half of the coupling and to overlap the other half of the coupling, with a pair of opposed cooperating bearing surfaces formed between the cylindrical internal surface of the projection and the cylindrical external surface of the overlapped portion of the coupling, the bearing surfaces being formed as captivating endless ball bearing races of V or semicircular cross-section, which retain a set of bearing balls therebetween to permit relative rotation of said coupling halves while resisting relative axial movement.

3,855,819

ELECTRO-MECHANICAL NEEDLE SELECTING MEANS FOR CIRCULAR KNITTING MACHINES

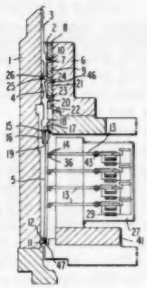
Masatoshi Sawazaki, Kobe, Japan, assignor to Precision Fukuhara Works Ltd., Higashinada-ku, Kobe, Japan

Filed June 18, 1973, Ser. No. 371,173

Claims priority, application Japan, Feb. 23, 1973, 48-021816

Int. Cl. D04b *9/00, 15/78*

U.S. Cl. 66—50 R 9 Claims



1. Needle selecting means for circular knitting machines having a vertically disposed slotted needle cylinder and having needles adapted to be raised and lowered in said cylinder needle slots, lengthwise extending selector jacks also in said slots, said jacks being selectively movable and being operatively related to said needles in such manner as to cause said needles to be selectively raised as a consequence of said selective movement of said jacks, a cam rotating relative to said cylinder and being movable between first and second levels in the first of which said cam moves selected ones of said jacks and in the second of which said jacks are unaffected by said cam, and said jacks and said cam being operatively related in such manner that each of said jacks so moved by said cam at its said first level thereafter causes said cam to be moved from its said first to its said second level.

3,855,820

ARRANGEMENT FOR THE MANUFACTURE OF VELOUR

Karl Kohl, 10 Chlorodont Strasse, Obertshausen, Germany (6053)

Filed May 29, 1973, Ser. No. 364,762

Claims priority, application Germany, May 29, 1972, 2226005

Int. Cl. D04b *23/00*

U.S. Cl. 66—87 2 Claims

1. A process of manufacturing velour ware on a Raschel knitting machine comprising

a. a first needle bed of latch needles,

b. a second needle bed of latch needles located parallel to said first needle bed,

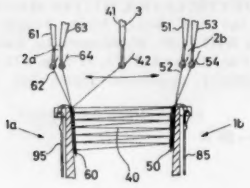
c. at least two first guides for laying thread about needles in said first needle bed,

d. at least two second guides for laying thread about needles in said second needle bed,

e. at least one third guide for laying a weft thread about needles in said first needle bed and about needles in said second needle bed said third guide being swingable substantially in the same plane as said first guides and said second guides and being located between said first guides and said second guides,

said process comprising

i. laying at least two threads about needles in said first needle bed by means of at least two first guides to form a first ground pattern,



ii. laying at least two threads about needles in said second needle bed by means of at least two second guides to form a second ground pattern,

iii. laying at least one weft thread about a needle in said first needle bed and,

a needle in said second needle bed by means of said at least third guide to provide a weft between said first ground pattern and said second ground pattern,

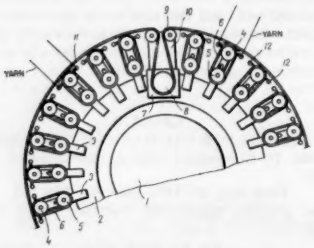
the elevations of said first needle bed and of said second needle bed relative to a predetermined point are the same at any predetermined time during the knitting cycle, the said guides laying the ground thread laying 2 or more even numbers of courses about the needles in their respective needle beds for each complete cycle of said third thread laying guide.

3,855,821

TAPE-POSITIVE YARN FEED

Josef Sterba, Brno, Czechoslovakia, assignor to Vyzkumny a vyvojory ustav Zavody vseobecneho strojirenstvi, Brno, Czechoslovakia

Filed Jan. 15, 1973, Ser. No. 323,773
Int. Cl. B04b *15/48, 15/50, 20/32*
U.S. Cl. 66—132 **2 Claims**



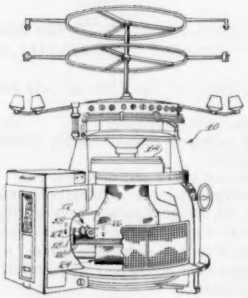
1. In a multifeed circular knitting machine having a cylinder, a yarn feeding device for feeding a plurality of yarns thereto, said device comprising a plurality of pairs of rotatably mounted idle feeding rollers and auxiliary rollers in angularly spaced relationship around the knitting machine, the feeding rollers being disposed generally in a circle coaxial of the cylinder of the machine, each of the auxiliary rollers being disposed radially inwardly of the feeding roller of its pair with respect to the said cylinder, each pair of a feeding roller and its auxiliary roller being joined by its individual separate feeding belt, each pair of rollers being fitted with an entrance guiding eyelet and a delivery guiding eyelet, all the separate feeding belts being on the radially outer surfaces of the feeding rollers in driving engagement with a continuous driving and feeding belt extending around the machine and around the feeding rollers thereof and receiving a uniform driving motion from a drive mechanism, the guiding eyelets guiding the individual yarns between the places of contact of the continuous driving and feeding belt with the respective separate feeding belts on the feeding rollers and their auxiliary rollers.

3,855,822

CIRCULAR KNITTING MACHINE TAKEUP WITH A SLITTING DEVICE

Billy M. Lee, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Mar. 24, 1972, Ser. No. 237,685
Int. Cl. D04b *35/00*
U.S. Cl. 66—147 **7 Claims**

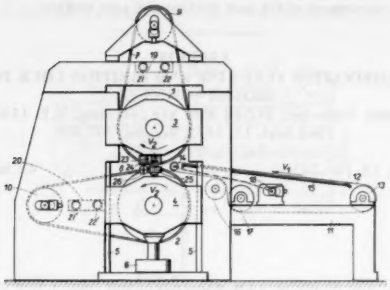


1. An attachment for a knitting machine of the type having a spreader structure for receiving thereover a tubular fabric progressively knitted during the operation of said machine to progressively deform the same from an open tubular condition into a flattened transversely elongated condition and cooperating take-up roll means for feeding therebetween the fabric in flattened condition passing from said spreader structure, said attachment comprising a housing, a pair of shafts journaled in said housing for rotational movement about axes disposed perpendicular to each other, a circular cutting blade fixed to one of said shafts exteriorly of said housing, a pair of gears on said shafts within said housing disposed in meshing relation with respect to one another, a pulley fixed to the other of said shafts exteriorly of said housing, driving means operatively connected with the exterior periphery of said pulley and adapted to be drivingly connected with said take-up roll means for imparting a rotational movement to said pulley in response to the fabric feeding movement of said take-up roll means, and means carried by said housing adapted to mount the same in an operative position on said machine in which (1) said cutting blade is disposed in cooperating relation with said spreader structure to progressively slit the fabric passing thereover along a longitudinally folded edge thereof and (2) said driving means is disposed in the aforesaid drivingly connected relation to said take-up roll means.

3,855,823
APPARATUS FOR CONTINUOUSLY CHAMOISING HALVES

Jaroslav Prosecky, No. 2 Vodni, and Lubomir Srda, 109 Hlubcicka, both of Krnov, Czechoslovakia

Filed Sept. 12, 1973, Ser. No. 396,613
Int. Cl. C14c *13/00*
U.S. Cl. 69—32 **3 Claims**

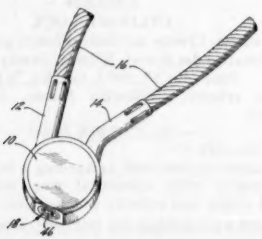


1. Apparatus for continuously chamoising hides, comprising two chamoising rollers one above the other driven in opposite directions and forming a nip therebetween, means for generating pressure between said rollers, an endless felt band encompassing each respective chamoising roller, a tensioning roller for tensioning each felt band, one of said bands being an upper felt band tensioned in the vertical direction, the other of said bands being a lower felt band tensioned in the horizontal direction, a feeding band conveyor having a surface speed lower than the circumferential speed of the chamoising rollers provided close to the nip of the chamoising rollers, the lower felt band being adapted to operate as a discharge conveyor for the treated hides, a moistening and washing unit provided inside the space between the upper chamoising roller and its respective tensioned felt band, and a moistening and washing unit provided inside the space between the lower chamoising roller and its respective tensioned felt band.

3,855,824
KEY RETAINING LOCK

Morris Falk, Palm Springs, Calif., assignor to Fort Lock Corporation, River Grove, Ill.

Filed Dec. 10, 1973, Ser. No. 423,167
Int. Cl. E05b *11/00, 67/06, 67/22*
U.S. Cl. 70—38 A **6 Claims**

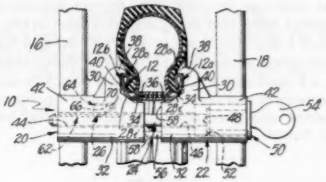


1. A locking device having a padlock body and first and second shackle parts interconnected by flexible cable or the like and having a key receiving locking mechanism which when rotated by a proper key inserted in the lock and rotated from a "lock" position to a lock "open" position, means associated with the key and locking mechanism prevents removal of the key, the combination comprising, rotatable retaining means connected to said lock mechanism disposed in said padlock body, said first and second shackle parts being received in bore means on opposite sides of said retaining means in the body, fixing means disposed between the retaining means and each of the shackle parts bearing against the retaining member and the shackle parts when the lock mechanism is in the "lock" position for holding said first and second shackle parts fixed to the padlock body, and said retaining means having indentation means thereon so that rotation with the lock mechanism to the "open" position aligns said indentation means with one of said shackle fixing means providing clearance therefor and the first shackle part associated therewith may be removed from the body bore means, plunger means contained within said removable shackle bore means being normally biased outwardly for movement against said shackle fixing means when the removable shackle is removed thereby holding said shackle fixing means in engagement with said retaining member indentation means and preventing rotation of said retaining member, locking mechanism and key to the "lock" position where said key may be removed from the lock.

3,855,825
BICYCLE LOCK

Frank W. Pickard, Inglewood, Calif., assignor to Eleanor D. J. Stanford, Los Angeles, Calif., a part interest

Filed Mar. 5, 1973, Ser. No. 338,065
Int. Cl. E05b *73/00*
U.S. Cl. 70—14 **3 Claims**



1. A rattle-free, quick-release bicycle lock, comprising:
a pair of jaws for gripping opposite sides of a rim of a spoked wheel in a direction generally parallel to an axial of said wheel, at least one of said jaws supporting a projection for engaging a fork-like frame member supporting the said axle when said jaws are affixed in place on said rim to limit rotation of said wheel, said jaws including coaxial openings;
a connecting shaft turnable in said coaxial openings in said jaws, axially fixed relative to a fixed one of said jaws, and axially slidable in the opening in a movable one of said jaws; and
cooperative means including one-way ratchet means on said movable jaw and connecting shaft for releasably locking said movable jaw against axial movement on said shaft away from said fixed jaw when said shaft is in a preselected rotational position relative to said movable jaw.

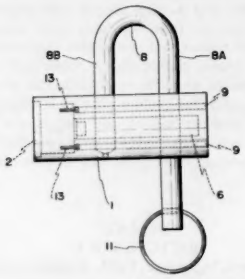
3,855,826
PADLOCK

Hideo Hori, Tokyo, Japan, assignor to Hori Lock Kogyo Kabushiki Kaisha, Minatoku, Tokyo, Japan

Filed May 2, 1973, Ser. No. 356,492
Int. Cl. E05b *67/22*
U.S. Cl. 70—38 A **1 Claim**

1. A padlock construction comprising a cylindrical barrel having a principal axis, a longitudinally extending bore commencing at one end of said barrel, and a counter bore communicating with said bore at an inner end thereof; said barrel

having a pair of transverse bores communicating with said counter bore; a shackle movable within said transverse bores between opened and closed positions, and selectively completely removable from said transverse bores, a locking bar rotably positioned within said counter bore and cooperating with said shackle to selectively immobilize the same, a lock body positioned within said first mentioned bore and cooperating with said locking bar, said lock body being accessible for the engagement of a key at one end of said barrel, said barrel having at least one elongated longitudinally extending bore



therin communicating at an opposite end of said barrel and terminating at an inner counter bore of smaller diameter communicating with said first mentioned bore, said lock body having at least one threaded bore therein aligned with said inner counter bore, said elongated bore intersecting at least one of said transverse bores in said barrels; said lock body being maintained within said barrel by threaded engagement with a screw inserted into said elongated bore, whereby subsequent insertion of said shackle into said barrel prevents access to said screw and unauthorized removal of said lock body from said barrel.

3,855,827

MAGNETICALLY-OPERATED LOCKING MECHANISMS

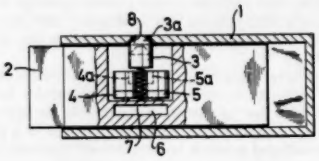
Hermann Hallman, and Branko Perkut, both of Hamburg, Germany, assignors to MRT Magnet-Regeltechnik GmbH, Hamburg, Germany

Filed Nov. 9, 1973, Ser. No. 414,328

Claims priority, application Germany, Apr. 26, 1973, 2321246; Oct. 10, 1973, 2350897

Int. Cl. E05b *47/00*

U.S. Cl. 70—134 **27 Claims**



1. In a magnetically-operated locking mechanism which includes at least one rotatably-mounted stop member which can be moved by means of a magnetic key into a release position from a locking position into which it is biassed and a control element which in the release position can enter a recess in the stop member by relative movement between the stop member and the control element in a direction parallel to the axis of rotation of the stop member, the control element being held against movement in said direction in the locking position of the stop member, so as to control movement of a locking bolt,

the improvement wherein the locking bolt is movable transversely to the direction of movement of the control element and the control element includes a cam portion which cooperates with a cam surface so that, in the locking position of the stop member, movement of the locking bolt is prevented by interaction of the cam portion and cam surface and that, in the release position, movement of the locking bolt is permitted and the control element enters the recess in the stop member upon relative sliding movement of the cam portion and cam surface.

3,855,828

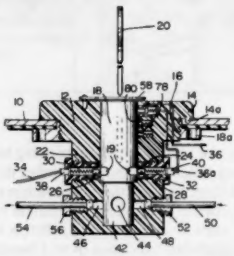
COMBINATION FUEL LINE AND IGNITION LOCK FOR MOTOR VEHICLES

Jerome Verderber, 192-10 35th Ave., Flushing, N.Y. 11358

Filed Sept. 17, 1973, Ser. No. 397,644

Int. Cl. B60r *25/04*

U.S. Cl. 70—243 **4 Claims**



1. An anti-theft device for an internal combustion engine of a motor vehicle comprising, in combination, lock means for simultaneously switching off an ignition circuit and shutting off a fuel supply for an engine, said lock means comprising a non-conductive lock housing, a lock cylinder rotatably displaceable in said housing, said cylinder being provided with a pair of spaced non-conductive inserts on its periphery and a lower end portion provided with a through bore, a pair of non-conductive bushings secured in said housing radially of said lock cylinder and alignable with said non-conductive inserts, contacts mounted in said bushings, springs in said bushings biasing said contacts against said cylinder, wire means for electrically connecting these elements in series with an ignition circuit of a motor vehicle; said housing having a pair of radially extending inlet and outlet passages alignable with said bore and tubing secured to said passages for connecting said inlet and outlet passages to a vehicle's fuel tank and a carburetor respectively.

3,855,829

CYLINDER LOCK

Paul Lipschutz, Croissy sur Seine, France, assignor to Societe d'Exploitation des Brevets Neiman, Neuilly S/Seine, France

Filed May 17, 1973, Ser. No. 361,109

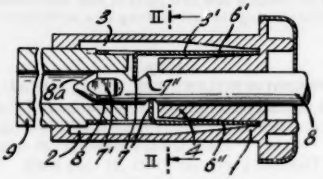
Claims priority, application France, May 17, 1972, 72.217544

Int. Cl. E05b *29/00*

U.S. Cl. 70—362 **10 Claims**

1. A safety cylinder lock comprising a hollow cylinder, a key-responsive inner cylindrical plug member rotatably mounted within said cylinder and rotatable by a removable key formed with notches and insertable into said plug member, and key-operated locking means carried by said plug member and releasably engageable with said cylinder, wherein the improvement consists in that said cylinder comprises an outer cylindrical casing portion and an inner substantially cylindrical core portion at least partially co-extensive in coaxial relationship with said outer casing portion to leave therebetween an intermediate annular space, the lateral peripheral surface of said inner core portion being formed with a number

of circumferentially spaced grooves whereas said locking means comprise resiliently flexible strips made fast with said rotor member and extending in generally parallel relation to the longitudinal axis of said lock and to said grooves, said strips being arranged according to an at least approximately cylindrical configuration coaxially surrounding said cylinder core portion and fitted with clearance in said annular intermediate space to be rotatable therein, said strips being circumferentially distributed in spaced relationship to be on the one hand removably engageable in their free unstrained rest positions with at least some of said grooves provided in said cylinder core portion to hold said plug member against rotation when said key is removed, and on the other hand located in their resiliently radially outward deflected positions in a same substantially cylindrical surface within said intermediate annular space in a given rotary postion of said rotor member to be disengaged from said cylinder core portion and allow free rotation of said plug member, each strip being formed with a radially inward projecting catch element engageable with said key in the fully inserted position of the latter for moving said strips out of and into said grooves.

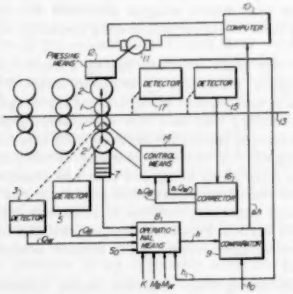


3,855,830

METHOD AND APPARATUS FOR CONTROLLING PLATE THICKNESS IN A ROLLING MILL

Hidehiro Kitanosono; Takeaki Kubo, and Shigeru Shida, all of Hitachi, Japan, assignors to Hitachi Ltd., Tokyo, Japan

Continuation of Ser. No. 60,223, Aug. 3, 1970, abandoned. This application Nov. 27, 1972, Ser. No. 309,923
Claims priority, application Japan, Aug. 4, 1969, 44-61009
Int. Cl. B21b *37/00*
U.S. Cl. 72—8 **4 Claims**



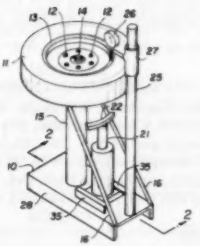
1. Apparatus for controlling the thickness of a rolled material in a rolling mill of a type having a pair of work rolls and at least a pair of back up rolls wherein a roll separating force is applied between the roll bearings of the work rolls and between the roll bearings of the back up rolls of a roll stand in the direction opposite to a roll depressing force, said apparatus comprising means for setting the roll clearance and for providing an output indicative thereof including roll depressing force control means; means for setting the roll separating force for the work roll bearings and for the back up roll bearings and for providing an output indicative thereof including roll separating force control means for the work roll bearings and for the back up roll bearings; setting means for providing an output indicative of the modulus of rigidity between the roll bearings and a housing and the modulus of rigidity of the whole mill; a detector for providing an output indicative of the roll depressing force; a detector for providing an output indicative of the roll separating force at the work roll bearings and a detector for providing an output indicative of the roll separating force at the back up roll bearings; plate thickness operational means responsive to the outputs of said setting means and detectors for providing an output indicative of the thickness of the rolled material on the exit side of the roll stand; a compressor for comparing the output of said operational means with a desired value to determine the deviation therebetween and providing an output indicative thereof; and control means for recedving the output of said comparator for generating a control signal to control at least one of said roll depressing force control means and said roll separating force control means for varying at least one of the depressing force and separating force at both the work roll bearings and back up roll bearings, and further comprising a detector for detecting the amount of crown of the rolled material on the exit side of the roll stand and shape control means for receiving the output of said crown detector and generating a signal to control said roll separating force control means for varying the separating force at the work and back up roll bearings so as to eliminate the crown.

3,855,831

WHEEL STRAIGHTENER

Frank Senkyrik, Seagonville, Tex., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Mar. 16, 1973, Ser. No. 342,296
Int. Cl. B21c *51/00*
U.S. Cl. 72—32 **2 Claims**



1. Apparatus for straightening the wheels of an automobile, consisting of a central mount, fastened to a base, upon which an automobile wheel may be fastened through holes in its hub, said central mount being rotatable with respect to said base, with a gauge supported from the base independently of the central mount and located adjacent to a section of the rim of said automobile wheel in the fastened position, said gauge measuring the variation of deflection from a plane of the automobile rim as said fastened automobile rim and wheel is rotated, together with

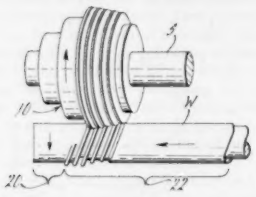
a hydraulic jack mounted to the base and located to bear against the automobile rim directly opposite the gauge such that the gauge will measure the deflection of the stressed wheel rim as the hydraulic jack bears upwardly against the wheel rim in restoring the wheel to a plane condition.

3,855,832

METHOD OF AND APPARATUS FOR MANUFACTURING INTEGRAL FINNED TUBING

Arthur H. Novak, 29900 Woodland Dr., Southfield, Mich. 48075

Filed Jan. 21, 1974, Ser. No. 434,955
Int. Cl. B21h 3/00
U.S. Cl. 72—84 3 Claims



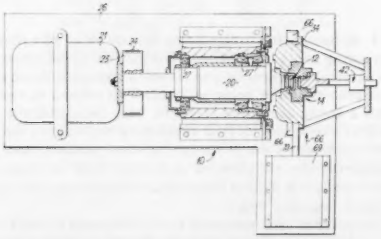
1. The method of making finned tubing which comprises providing a tube to be finned and which is rotatable about a fixed axis, providing a forming roll having a series of annular forming projections thereon of sequentially increasing diameter, the tube also being movable longitudinally of its axis relatively to the roll, driving the roll rotatably about an axis which is inclined with relation to the axis of the tube and which is spaced from the tube at a fixed distance such that when the roll is at the closest crossing point of such axes the projections are in full working engagement with the tube, characterized by moving the roll longitudinally of its axis of rotation from a start-position in which the roll is disengaged from the tube to said position of full engagement and maintaining such full engagement while driving the roll and tube in synchronous meshed engagement about their respective axes and permitting the tube to move longitudinally of its axis relatively to the rolls, whereby the projections deform a helical section of the tube, the path of longitudinal movement of the points of engagement of the projections with the tube, during feeding of the roll into such full engagement, being substantially perpendicular to the helix angle.

3,855,833

ROLLING MACHINES

Gordon Sidney Connell, Cheltenham, England, assignor to Formflo Limited, Gloucestershire, England

Continuation-in-part of Ser. No. 298,198, Oct. 17, 1972, abandoned. This application June 26, 1973, Ser. No. 373,702
Claims priority, application Italy, Oct. 19, 1972, 53480/72; Great Britain, Oct. 20, 1972, 49248/72
Int. Cl. B21b
U.S. Cl. 72—91 10 Claims



1. A roll forming machine comprising:

a rotatable profiled forming roll, a rotatable outer profiled roll, said profile of said roll having a cross-sectional plane with a maximum diameter at plane intermediate the limits of said profile, means for moving said inner and outer forming rolls transversely of their axes of rotation relative to one another during roll forming to form a nip between said rolls in which said workpiece is squeezed to a shape corresponding to the profiles of said inner and outer forming rolls, said outer forming roll being capable of being split into two parts which coincide with said plane of maximum diameter at said profiled rolling surface whereby said two parts of said outer forming roll can be separated after roll forming a workpiece to allow for removal of said shaped workpiece, and

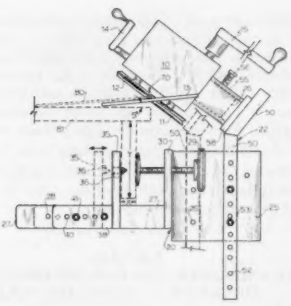
means for holding said two parts of said outer forming roll together during the roll forming of a workpiece.

3,855,834

MULTIPOSITION HOLDER FOR SHEET METAL EDGER

Robert B. Evans, 21211 Currin Ave., Durham, N.C. 27707

Filed July 5, 1973, Ser. No. 376,283
Int. Cl. B21d 5/14
U.S. Cl. 72—179 3 Claims



1. A tool holder structure for an edging tool of the type having upper and lower edging wheels, a work piece guide plate angularly positioned with respect thereto, an operator mechanism for adjusting and operating said wheels and a spindle mounting said tool on a holder, comprising in combination:

a. a rear vise plate structure having a rear vise clamping plate and arm means integral therewith for adjustably securing such structure to a mating opposing vise structure;

b. a front vise plate structure having a front vise screw clamp support plate, screw vise clamp means threadably mounted in said support plate, arm means integral therewith and mating with said rear vise clamping plate arm means, securing means for securing said respective arm means together in any of a plurality of table mounting positions adapted to bring said rear vise clamping plate and screw vise clamping means in predetermined laterally spaced and opposed positions for releasably clamping a worktable vertical member therebetween and having an appended vertical support plate formed integral therewith; and

c. a tool mounting-yoke structure having appended arm means arranged for being secured to said front vise plate structure vertical support plate in any of a plurality of predetermined yoke structure mounting positions, securing means for securing said mounting-yoke structure arm means to said vertical support plate and having a receptacle formation integrally secured to said mounting yoke structure, said receptacle formation being mated to receive said tool spindle in a releasable, rotatable relation with screw means to releasably secure said spindle, said table mounting positions and said yoke structure mounting positions being arranged whereby said tool turning

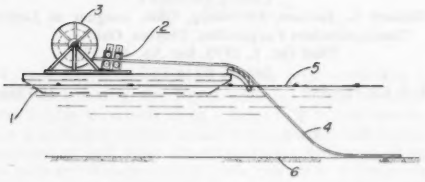
wheels and guide plate are enabled to be positioned in a normal angular vertical position with respect to the work piece for a relatively small work piece and to be positioned substantially less vertically for a relatively large work piece whereby the work piece may be supported by the worktable, and said rear and front vise plate structures may be adjusted according to the width and height of the worktable vertical member to which said tool holder structure is clamped such that the space between said turning wheels may at all times be located near or over the worktable to which the tool holder structure is clamped.

3,855,835

APPARATUS FOR LAYING PIPELINES

Benjamin Cornwall Tisdale, III, 10144 Idlewood Pl., New Orleans, La. 70123, and William Buford Nicholson, 4409 Cleveland Pl., Metairie, La. 70003

Filed Dec. 10, 1973, Ser. No. 423,206
Int. Cl. B21d *3/02*
U.S. Cl. 72—183 **1 Claim**



1. In an apparatus supported on a floating vessel for laying pipeline on a water bottom, pipeline straightening means comprising in combination:

a. reel means mounted for rotation around a horizontal axis on said vessel for the dual function of reeling a pipeline on for storage and off for laying, and for defining a first rigid point of three sequential points between which a pipeline must be led to remove a curvature therein and place one thereon;

b. a first set of rollers, adapted to vertical adjustment, and defining the second point of said three sequential points, said first set comprising a pair of peripherally opposed rollers mounted for rotation around parallel vertical axes, and a second pair similarly opposed and mounted for rotation around parallel horizontal axes, said pairs of rollers defining a pipeline passageway;

c. a second set of rollers similar to the first set and spaced therefrom with its pairs of rollers reversed to define the third point of said three sequential points and a continuation of said pipeline passageway;

d. a first platform mounted on said floating vessel adjacent said reel, the first set of rollers being fixed thereon and said platform being adjustably movable parallel to the horizontal axis of said reel for the horizontal adjustment of said first set relative to said reel;

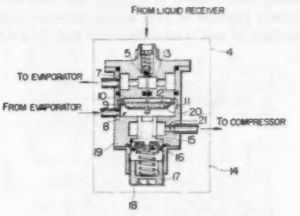
e. a second platform mounted for horizontal movement on said first platform, the second set of rollers being fixed on said second platform and spaced from said first set of rollers, the second platform being adjustably movable parallel to the horizontal movement of said first platform for the horizontal adjustment of said second set of rollers relative to said first set, whereby said first and second set of rollers are precisely alignable to direct a pipeline onto the reel to prevent excessive bending and coating damage, and off the reel straightened for laying.

3,855,836

DEVICE FOR CONTROLLING COOLANT PRESSURE IN EVAPORATOR

Reijiro Takahashi; Kazuo Kanemoto, both of Katsuta, and Toshikatu Ito, Ibaraki-ken, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 23, 1974, Ser. No. 435,971
Claims priority, application Japan, Jan. 24, 1973, 48-9542
Int. Cl. F25b *41/04*
U.S. Cl. 62—217 **8 Claims**



1. A pressure control valve for:

a cooling system having,

a compressor for compressing a coolant,

a condenser for condensing the coolant compressed in said compressor into a liquid,

a liquid receiver for separating the coolant from the condenser into liquid and gas,

an expansion valve for subjecting the liquid coolant from the liquid receiver to expansion,

an evaporator for causing heat-exchange between coolant gas from the expansion valve and air,

a pressure control valve for maintaining the pressure in the evaporator at a level higher than a predetermined level, and

means for returning the coolant gas from said pressure control valve to the compressor; characterized by that

said evaporator includes a plurality of coolant gas passages arranged in parallel and a collector for collecting the coolant flowing through said plurality of the coolant gas passages;

a housing mechanically connected with said collector;

a biasing means provided in said housing, said biasing means having one side, to which is exerted the gas pressure in the collector;

a spring for exerting a force on the other side of said biasing means;

an adjusting screw for adjusting the pressure of the spring; and

a valve means provided between the collector and the means for returning the coolant to the compressor and having an opening capable for varying its size.

3,855,837

MACHINE FOR CORRECTING ECCENTRICITY AND RUNNING OUT OF TRUE IN STAMPED STEEL WHEELS

Erich Philipp, Dabringhausen, Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed May 15, 1973, Ser. No. 360,492
Claims priority, application Germany, May 17, 1972, 2224027
Int. Cl. B21d *22/00*
U.S. Cl. 72—354 **1 Claim**

1. A machine for correcting eccentricity and running out of true in a disc type steel pressing wheel,

said wheel having an annular wheel dish,

said wheel dish having an outer edge and a center bore,

said wheel dish having first and second annular support surfaces adjacent said center bore,

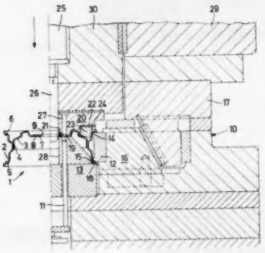
said wheel also having a wheel rim with first and second axially spaced tire support surfaces and first and second axially spaced apart rim shoulders,

said wheel rim being affixed to said outer edge of said wheel dish,

said machine comprising a supporting calibrating tool having radially spaced apart first and second calibrating faces,

said first calibrating face of said supporting calibrating tool being constructed to engage said first support surface of said wheel dish,

said second calibrating face of said supporting calibrating tool being constructed to engage said first rim shoulder, the surface portion of said wheel between said first support surface of said wheel dish and said first rim shoulder



being spaced apart from said supporting calibrating tool when said supporting calibrating tool is in engagement with said first support surface and said first rim shoulder, a plurality of radially movable segmental calibrating tools,

said segmental calibrating tools each having first and second axially spaced arcuate calibrating faces constructed to engage said first and second tire support surfaces, respectively,

the surface portion of said wheel rim between said first and second tire support surfaces being spaced apart from said segmental calibrating tools when said segmental calibrating tools are in engagement with said first and second tire support surfaces,

first means constructed to force said segmental calibrating tool radially inwardly into engagement with said tire support surfaces,

said first means including an axially movable hydraulic ram, wedge means interposed between said hydraulic ram and said segmental calibrating tools and constructed to translate the axial displacement of said ram to radial displacement of said segmental calibrating tools,

an axially movable calibrating tool having radially spaced apart first and second calibrating faces,

said first calibrating face of said axially movable calibrating tool being constructed to engage said second support surface of said wheel dish,

said second calibrating face of said axially movable calibrating tool being constructed to engage said second rim shoulder,

the surface portion of said wheel between said second support surface of said wheel dish and said second rim shoulder being spaced apart from said axially movable calibrating tool when said axially movable calibrating tool is in engagement with said second support surface and said second rim shoulder,

second means constructed to force said axially movable tool into engagement with said wheel dish and said wheel rim, said second means including an axially movable hydraulic ram disposed concentrically within said ram of said first means,

said second means including means constructed to force said calibrating faces of said axially movable calibrating tool into hammer-pressing engagement with said support surface means of said wheel dish and said second rim shoulder,

said first means being constructed to hold said calibrating faces of said segmental tools in engagement with said tire support surfaces at the same time said second means forces said calibrating faces of said axially movable calibrating tool into hammer-pressing engagement with said second support surface of said wheel dish and said second rim shoulder,

a center bore calibrating tool constructed to engage the periphery of said center bore,

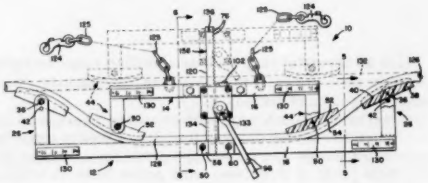
third means constructed to force said center bore calibrating tool into engagement with said center bore periphery, said third means being constructed to hold said center bore calibrating tool in engagement with said center bore periphery at the same time said second means forces said calibrating faces of said axially movable calibrating tool into engagement with said second support surface and said second rim shoulder.

3,855,838

APPARATUS FOR FORMING VARIABLE LENGTH CABLE OFFSETS

Richard L. Jackson, Lewisburg, Ohio, assignor to Jackson Communications Corporation, Clayton, Ohio

Filed Oct. 1, 1973, Ser. No. 402,358
Int. Cl. B21d 9/05
U.S. Cl. 72—389 **10 Claims**



1. Apparatus for forming in a cable an expansion loop consisting of a substantially straight section offset from and generally parallel to the main body of the cable and joined thereto by gently curved interconnecting portions comprising:

a. a base frame including a central portion and spaced, outwardly projecting outer shoe supports,

b. a center frame including a central portion and outwardly projecting inner shoe supports spaced from each other along said center frame,

c. means mounting said center frame in opposed relationship to said central portion of said base frame,

d. cable engaging shoes,

e. means for rotatably mounting said shoes on said outer and inner shoe supports of said base and center frames with cable engaging surfaces of said shoes on said center frame disposed in opposition to cable engaging surfaces on said shoes mounted on said base frame, and

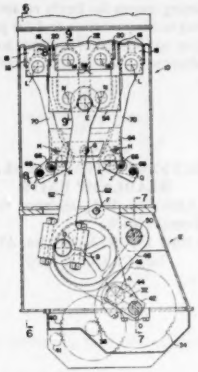
f. means for moving said base and center frames toward each other with a cable engaged by said opposed cable engaging surfaces on said shoes to form said substantially straight offset section in said cable at that portion thereof between said inner shoe supports.

3,855,839

DRIVE LINKAGE FOR DOUBLE ACTION PRESS

John G. Lose, Lansdowne, Pa., and John F. Roth, Salem, Ohio, assignors to Gulf & Western Manufacturing Company, New York, N.Y.

Filed Feb. 21, 1974, Ser. No. 444,338
Int. Cl. B21d *24/12*
U.S. Cl. 72—417 **36 Claims**



1. In a double action metal working press comprising a frame, work holding slide means supported by said frame for reciprocating movement along a linear path to hold and release a workpiece relative to said frame, plunger slide means supported by said frame for reciprocating movement along said path and through a work stroke relative to a workpiece held by said work holding slide means, said work holding slide means including driven and work holding slides and linkage means interconnecting said slides for reciprocation of said driven slide to impart intermittent reciprocating movement to said work holding slide, and drive means for reciprocating said plunger slide means and said driven slide, the improvement comprising: said drive means including crank means supported by said frame for rotation about a first axis, connecting link means pivotally interconnected with said crank means at a second axis spaced from said first axis, first slide link means having opposite ends pivotally interconnected one with said connecting link means at a third axis spaced from said second axis and the other with said plunger slide means, constraining link means pivotally interconnected with said frame at a fourth axis spaced from said first axis and pivotally interconnected with said connecting link means at a fifth axis spaced from said second axis, and second slide link means having opposite ends pivotally interconnected one with said constraining link means at a sixth axis spaced from said fourth and fifth axes and the other with said driven slide.

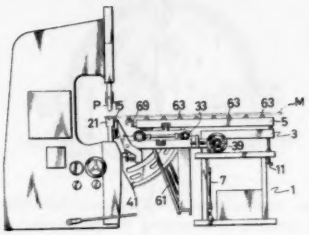
3,855,840

MATERIAL SUPPORT APPARATUS FOR A PRESS BRAKE SYSTEM

Susumu Kawano, Isehara, Japan, assignor to Amada Company Limited, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 191,319, Oct. 21, 1971, abandoned. This application Mar. 30, 1973, Ser. No. 346,459
Int. Cl. B21d *5/01*
U.S. Cl. 72—418 **3 Claims**

1. For use with a press brake or bending press of the type having an upper stationary die cooperating with a lower vertically movable die to bend a workpiece positioned therebetween, a workpiece support apparatus comprising in combination: a base fixed in relation to the press brake or bending press; a frame supported on and movable vertically in relation to said base; a table carried on and pivotally movable relative to said frame, said table being positioned to support a workpiece having a portion thereof located between the upper and lower dies; first operating means for imparting vertical motion to said frame; second operating means for imparting pivotal motion to said table; first control means responsive to vertical movement of the lower die, said first control means being associated with said first operating means and being operative



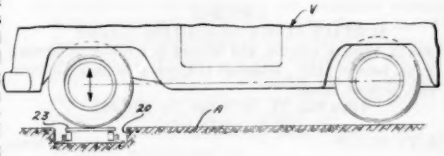
in conjunction therewith to move said frame vertically in unison with the lower die; and second control means responsive to pivotal movement of a workpiece supported on said table during a bending operation, said second control means being associated with said second operating means and being operative in conjunction therewith to pivotally move said table in unison with the workpiece supported thereon.

3,855,841

METHOD OF TESTING VEHICLE SHOCK ABSORBERS AND APPARATUS THEREFOR

Lee Hunter, 13501 Ladue Rd., Ladue, Mo. 63141

Filed Feb. 23, 1973, Ser. No. 335,349
Int. Cl. G01m *17/04*
U.S. Cl. 73—11 **7 Claims**

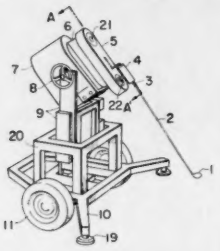


1. Apparatus for testing shock absorbers in place in the wheel suspension systems for vehicles, consisting of a support plate the boundary of which defines an area sufficiently large for at least a first wheel of a vehicle having front and rear wheels, the vehicle being horizontally positioned with a first wheel on said support plate and other wheels spaced there from, a frame carrying said support plate, vehicle wheel load responsive transducer means between said frame and plate, said transducer means being positioned symmetrically around the boundary of said support plate to respond to the load of said first wheel and generate a signal proportional to the first wheel load imposed on said plate at any location of the first wheel on said plate, signal display means connected to said transducer means to display the load imposed on said support plate, and drive means to oscillate said support plate in a vertical direction along a linear path to oscillate said first wheel through its critical frequency and gyrate the vehicle about said other wheels.

3,855,842
APPARATUS FOR TESTING GOLF CLUBS

Junpei Imabori, Nishinomiya; Takeshi Kuzuoka, Kobe, and Atsuhiko Mori, Osaka, all of Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe-shi, Kyogo, Japan

Filed May 16, 1973, Ser. No. 361,005
Claims priority, application Japan, May 24, 1972, 47-51351
Int. Cl. G01m *3/00*
U.S. Cl. 73—13 **2 Claims**

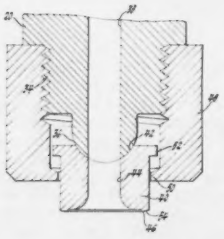


1. An apparatus for testing dynamic characteristics of a golf club, said apparatus comprising:
   a. a main body;
   b. arm means rotatably mounted on said main body, said arm means swinging relative to said main body;
   c. club holder means for holding said golf club and rotatably mounted on said arm means, said club holder means rotating relative to said arm means;
   d. first drive means for rotating said arm means independently of said holder means;
   e. second drive means independent of said first drive means, for rotating said holder means independently of said arm means; and
   f. signal generator means for applying first and second program signals to said first and second drive means, respectively, whereby said drive means are controlled independently of each other by said program signals so that a plurality of golf club swing patterns may be simulated by the combination of independent operations of said first and second drive means.

3,855,843
SURFACE FINISH MEASURING GAUGE

Frank D. Yagiela, Livonia, and Millard D. Crowell, Whitmore Lake, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 31, 1973, Ser. No. 365,462
Int. Cl. G01b *5/28*
U.S. Cl. 73—37 **3 Claims**

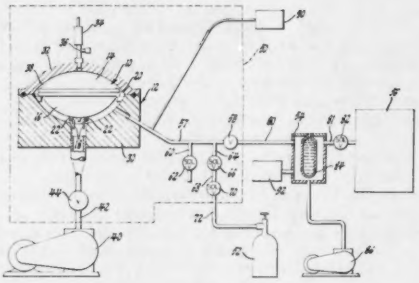


1. A fluid gauge for measuring surface finish comprising, a triangular base member; a pair of support members depending from two apices of said base member and being disposed in a plane intersecting the plane of the base member; fluid conducting means including passage means for conducting fluid and being secured to the third apex of said base member and being disposed in a plane intersecting the plane of the base member, a hemi-spherical end on said passage means; measuring head means for conducting fluid from said passage means to the surface to be measured including, a spherical recess sealingly mating with said hemi-spherical end an annular surface adapted to be disposed adjacent the surface to be measured and a fluid passage aligned with said passage means communicating between said spherical recess and said annular surface; and retaining means for freely retaining said spherical surfaces in abutting sealing relation and for permitting relative movement between said spherical surfaces so that said annular opening will be disposed substantially parallel to the surface being measured.

3,855,844
LEAK DETECTION SYSTEM FOR SEALED BEAM HEADLAMP UNITS

Gale M. Craig, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 15, 1973, Ser. No. 415,999
Int. Cl. G01m *3/20*
U.S. Cl. 73—40.7 **3 Claims**

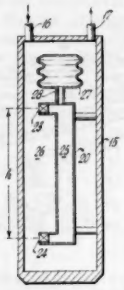


1. A leak detection system for a sealed beam headlamp unit having a gas fill including helium, said leak detection system comprising: a device operative to detect helium; a test chamber adapted to receive said unit; means for evacuating said test chamber to thereby draw said gas fill including helium through any unit leakage paths into said chamber; means for injecting a carrier gas into said test chamber after evacuating the latter, said gas admixing with any gas fill that has leaked from the unit; first checking means operably connected to said test chamber for indicating if the pressure in said chamber is above a first predetermined value indicative of a high rate of leakage; a cold trap operative to condense the carrier gas and the gas fill other than helium; means fluidly connecting said test chamber with said cold trap if the pressure in said test chamber as indicated by said first checking means is below said first predetermined value; second checking means operatively connected to said cold trap for indicating when the pressure thereat is above a second predetermined value indicative of a high rate of leakage but lower than said first predetermined value; means fluidly connecting said cold trap with said device if the pressure at said cold trap as indicated by said second checking means is below said second predetermined value whereby said first and second checks prevent excessive ingestion of helium at the device.

3,855,845
GAS SPECIFIC GRAVITY METER

George A. J. Homolka, Ft. Worth, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 15, 1972, Ser. No. 315,376
Int. Cl. G01b 9/26
U.S. Cl. 73—30 9 Claims



1. A meter for measuring specific gravity of gas, comprising in combination

a first container for holding a column of gas to be measured, a second container for holding a column of standard gas, means subjected to the pressure of said columns near the tops thereof for equalizing most of the pressure difference thereat, comprising a bellows connected to said standard gas column and having a volume that is large compared to the volume of the column,

first electronic means for measuring the pressure difference of said columns of gas near said tops thereof,

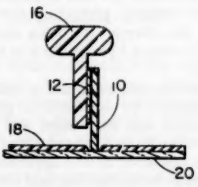
second electronic means for measuring the pressure difference of said columns of gas at a location vertically displaced a predetermined distance beneath said electronic means, and

electrical means for determining the difference between said pressure difference measurements.

3,855,846
SAMPLE APPLICATOR

Ronald D. Forget, Owl's Head, Maine, and Calvin A. Saravis, Waban, Mass., assignors to Marine Colloids, Inc., Rockland, Maine

Filed Apr. 7, 1972, Ser. No. 241,921
Int. Cl. G01n 31/08
U.S. Cl. 73—61.1 C 5 Claims

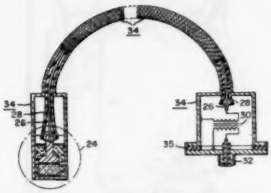


1. An applicator for applying samples of aqueous test solution to a hydrated gel film for subjection to electrophoretic or chromatographic procedures comprising a plurality of spaced apart stiff resilient non-absorbent polymeric sheet sample holders having a thickness from 3 to 125 mils and having a hydrophilic surface each sample holder having an uninterrupted straight flat bottom.

3,855,847
ACOUSTIC EMISSION TRANSDUCER AND MONITORING SYSTEM

Walter C. Leschek, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 20, 1972, Ser. No. 264,663
Int. Cl. G01h 1/00
U.S. Cl. 73—71.4 32 Claims



1. An improved acoustic emission transducer system for monitoring acoustic signals generated by a metal specimen when subject to mechanical stress comprising:

a tubular housing having a side wall;

a thin metallic window enclosing one end of said housing to form the bottom wall thereof;

a piezoelectric element acoustically coupled to the interior of said bottom wall of said housing;

a positive electrode electrically coupled to said piezoelectric element;

means for electrically insulating said electrode and said piezoelectric element from the side wall of said housing; means for sealing said piezoelectric element against moisture so as to prevent moisture from shorting said element, access being provided to said electrode through said sealing means;

means for mechanically damping both piezoelectric element resonances and spurious housing resonances;

an electrically conductive connecting cable having two leads, one grounded at one end to said housing and the other electrically coupled at one end to said positive electrode;

an electrically conductive transmission cable circuit having two leads, one positive and one ground;

a transformer, having primary and secondary windings, designed to match the transducer impedance coupled to said primary winding through said connecting cable to the characteristic impedance of said transmission cable coupled to said secondary winding, one end of said primary and secondary windings, respectively, is grounded at separate electrically isolated points; and

means for insulating said primary winding ground from said secondary winding ground.

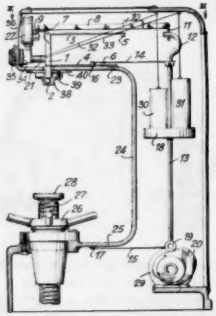
3,855,848
HARDNESS TESTING MACHINE

Marc Jean Sidler, Le Vesinet, France, assignor to S.K.F. Compagnie D'Applications Mecaniques, Clamart, France

Filed Dec. 12, 1972, Ser. No. 314,346
Claims priority, application France, Dec. 21, 1971, 71.45860
Int. Cl. G01n 3/44
U.S. Cl. 73—81 11 Claims

1. In a machine for testing the hardness of material by the Rockwell testing method, of the type including, in its frame, a single pivoted lever permanently supporting a minor preloading weight positioned on the same side of the lever fulcrum as means for operatively associating the lever with a penetrator having a point, and having, at its free end, means for attaching it to a major loading weight, the improvement comprising said fulcrum being formed by a pair of crossed first blades secured to said lever and forming an articulation therefor; second and third blades secured at their free ends respec-

tively to said penetrator and to said major weight, and having fixed ends secured to said frame, said second and third blades respectively guiding said penetrator and said major weight; said means for operatively associating said lever with said penetrator being constituted by a fourth blade secured to said



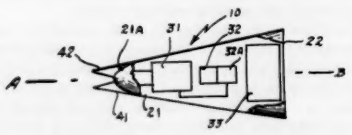
penetrator and engaging said lever; said blades being elastically flexible transversely but non-extensible longitudinally; said crossed first blades constituting the sole means articulating said lever, and said second and third blades constituting the sole means respectively guiding said penetrator and said major weight.

3,855,849

REENTRY VEHICLE NOSE TIP FLIGHT TESTING APPARATUS

Jack M. Lordan, San Pedro, Calif., assignor to The United States of America as represented by the Secretary of the United States Air Force, Washington, D.C.

Filed Apr. 16, 1973, Ser. No. 351,725
Int. Cl. G01n *17/00*
U.S. Cl. 73—86 **2 Claims**



1. An apparatus for simultaneously flight testing a plurality of reentry vehicle nose tips, comprising:
   a. a reentry flight test vehicle having a front end;
   b. means for fixedly mounting a plurality of reentry vehicle nose tips, which are to be flight tested, on the front end of said test vehicle; and
   c. means, in each said nose tip, for measuring changes in the tips during reentry.

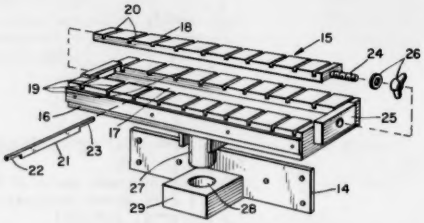
3,855,850

WIRE WRAP QUALIFICATION TEST FIXTURE

James Norskog, Los Angeles, Calif., assignor to General Telephone Company of California, Santa Monica, Calif.

Filed Dec. 10, 1973, Ser. No. 423,499
Int. Cl. G01n *3/02*
U.S. Cl. 73—88 B **4 Claims**

1. A wire wrap qualification test fixture comprising, in combination:
   a. mounting means including a flat plate having a vertical journalling bore;
   b. a test terminal holding means including an elongated horizontal block having a shaft extending vertically downwardly from its central underside to be received in said bore for rotation of 180°; and
   c. keying means constituting an upper edge area of said flat plate and the juxtaposed lower side area of said block, lifting of said block above the level of said upper edge freeing the block for rotation, said block still being rotationally coupled to said mounting means in its raised



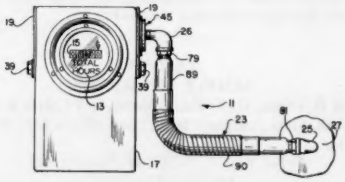
position but free to rotate 180° whereby the opposite ends of test terminals held in said holding means may be wire wrapped and tested from one side of said fixture by first wire wrapping the terminal ends on said one side and then rotating said holding means 180° to position the opposite terminal ends on said one side for wire wrapping and testing.

3,855,851

TAMPER-PROOF TIME INTERVAL RECORDING SYSTEM

William F. Paul, Sr., 2200 Sangamon Ave., Springfield, Ill. 62702

Filed Oct. 26, 1971, Ser. No. 192,526
Int. Cl. G01m *15/00*; **F16l** *13/00*
U.S. Cl. 73—115 **16 Claims**



1. A tamper-proof recording device comprising:
a parameter recording instrument;
a protective enclosure for said instrument, said enclosure when intact securely protecting said instrument from tampering, and adapted for being secured to apparatus with regard to which a parameter is to be recorded by said instrument;
means for securing said enclosure to said apparatus;
a conduit adapted to be connected for providing communication between said instrument and said apparatus to cause recording by said instrument of said parameter in response to operation of said apparatus; and
connector means for connecting said conduit between said enclosure and said apparatus so as substantially to prevent nondestructive disconnection of said conduit following said connecting thereof, said conduit comprising a length of tubular material, said material being relatively flexible but resisting any substantial twisting thereof, said connector means comprising respective threaded fittings at opposite ends of said material for being respectively threaded to connections at said enclosure and said appa-

ratus, said fittings each having the same thread direction orientation whereby when both are threaded neither of said fittings may be turned in a direction to cause unthreading by loosening thereof without causing tightening of the other fitting.

3,855,852

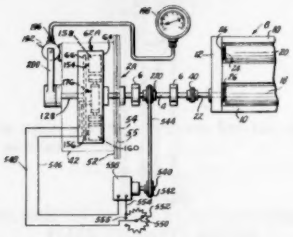
APPARATUS FOR CONTROLLING THE CHARACTERISTICS OF MAGNETICALLY OPERATED FRICTION TYPE POWER ABSORPTION DEVICES

Edwin L. Cline, Pasadena, Calif., assignor to Clayton Manufacturing Company, Los Angeles, Calif.

Continuation of Ser. No. 838,997, July 3, 1969, abandoned, which is a division of Ser. No. 559,490, June 22, 1966, Pat. No. 3,453,874. This application Sept. 23, 1970, Ser. No. 74,885

Int. Cl. G01l *3/16*

U.S. Cl. 73—135 **2 Claims**



1. A friction type power absorber for use in analyzing the performance of a prime mover, comprising: a brake shaft for receiving driving torque from a member driven by a prime mover; power absorption means including rotor means connected with said brake shaft to receive driving torque from said brake shaft, stator means operatively disposed relative to said rotor means; friction brake means carried by one of either said rotor or stator means and movable into and out of frictional engagement with the other; electric actuator means operable to apply force for moving said friction brake means into said frictional engagement to thereby apply retarding force to said rotor in opposition to driving torque applied thereto by said brake shaft, the value of said retarding force varying with the force exerted by said actuator means; and control means including means to generate an electric signal to actuate an element of an electrical system for controlling said electric actuator means in accordance with the speed of rotation of said brake shaft so that the force exerted on said friction brake means by said actuator means varies as a function of said rotational speed and so that said retarding force is substantially zero at zero speed of said brake shaft and increases and decreases in value at a rate faster than said driving torque.

3,855,853

WELL BORE FORCE-MEASURING APPARATUS

Jackson R. Claycomb, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed May 9, 1973, Ser. No. 358,562

Int. Cl. E21b *45/00*

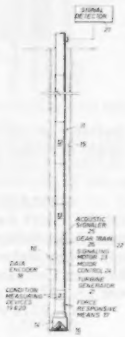
U.S. Cl. 73—151 **15 Claims**

1. Apparatus adapted for measuring at least one downhole load condition while drilling a borehole and comprising:

a drill string having a borehole-drilling device dependently coupled to the lower end thereof and defining a fluid passage for circulating drilling fluids between the surface end of said drill string and said borehole-drilling device;

an elongated load-responsive member having opposite end portions respectively secured to spaced portions of said drill string and cooperatively arranged for normally maintaining said load-responsive member in tension and an unrestrained intermediate portion adapted to vary in tension in response to increases and decreases in loads imposed on said drill string tending to move said spaced portions thereof in relation to one another;

transducer means coupled to said intermediate portion of said load-responsive member and having a measurable characteristic adapted for varying in response to changes in the tensile forces in said load-responsive member occurring upon relative movement between said spaced portions of said drill string;



acoustic-signaling means on said drill string operatively coupled to said transducer means and cooperatively arranged for producing acoustic signals representative of variations in said measurable characteristic in drilling fluids flowing through said drill string; and

acoustic signal-detecting means operatively coupled to said surface end of said drill string and cooperatively arranged for detecting said acoustic signals.

3,855,854

IMPRESSION PACKER

Stanley O. Hutchison, Bakersfield; Glenn W. Anderson, Oildale, and Gordon L. Newby, Bakersfield, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

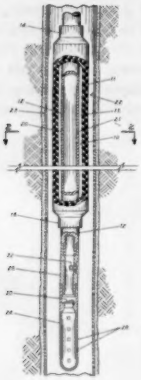
Filed June 25, 1973, Ser. No. 373,341

Int. Cl. E21b *47/00*

U.S. Cl. 73—151 **3 Claims**

1. An impression packer comprising a tubing section, an elongated resilient sleeve positioned over said tubing section, means connecting the ends of said sleeve in fluid-tight relationship with said tubing section to form an annular chamber between said tubing section and said sleeve, port means communicating with said annular chamber for inflating said resilient sleeve and an impression sleeve connected to said resilient sleeve for expansion and contraction therewith, said impression sleeve comprising a smooth rolled sheet containing about 60 to 80 percent by weight partially cured synthetic

nitrile rubber including cure chemicals, about 10 to 20 percent by weight natural rubber smoked sheet, about 5 to 15



percent by weight hydrated amorphous silica, and between 2 and 6 percent by weight of rubber processing oil.

3,855,855

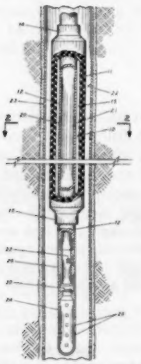
IMPRESSION PACKER

Stanley O. Hutchinson, Bakersfield; Glenn W. Anderson, Oildale, and Gordon L. Newby, Bakersfield, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed June 25, 1973, Ser. No. 373,342

Int. Cl. E21b *47/00*

U.S. Cl. 73—151 **3 Claims**



1. An impression packer comprising a tubing section, an elongated resilient sleeve positioned over said tubing section, means connecting the ends of said sleeve in fluid-tight relationship with said tubing section to form an annular chamber between said tubing section and said sleeve, port means communicating with said annular chamber for inflating said resilient sleeve and an impression sleeve connected to said resilient sleeve for expansion and contraction therewith, said impression sleeve comprising a smooth rolled sheet containing about 60 to 80 percent by weight synthetic nitrile rubber, about 10 to 20 percent by weight natural rubber smoked sheet, about 5 to 15 percent by weight hydrated amorphous silica, and between 2 and 6 percent by weight of rubber processing oil.

3,855,856

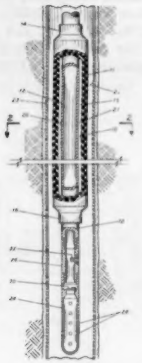
IMPRESSION PACKER

Stanley O. Hutchison, Bakersfield; Glenn W. Anderson, Oildale, and Gordon L. Newby, Bakersfield, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed June 25, 1973, Ser. No. 373,343

Int. Cl. E21b *47/00*

U.S. Cl. 73—151 **2 Claims**



1. An impression packer comprising a tubing section, an elongated resilient sleeve positioned over said tubing section, means connecting the ends of said sleeve in fluid-tight relationship with said tubing section to form an annular chamber between said tubing section and said sleeve, port means communicating with said annular chamber for inflating said resilient sleeve and an impression sleeve connected to said resilient sleeve for expansion and contraction therewith, said impression sleeve comprising a smooth rolled sheet containing between 50 percent by weight and 70 percent by weight natural smoked sheet rubber, between 10 percent by weight and 30 percent by weight hydrated amorphous silica to impart a smooth finish on said sheet and between 3 percent by weight and 15 percent by weight of rubber processing oil.

3,855,857

FORCE-MEASURING APPARATUS FOR USE IN A WELL BORE PIPE STRING

Jackson R. Claycomb, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Division of Ser. No. 358,562, May 9, 1973,. This application Nov. 19, 1973, Ser. No. 417,006

Int. Cl. E21b *47/00*

U.S. Cl. 73—151 **31 Claims**

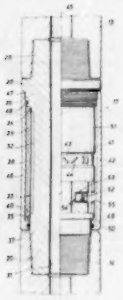
1. Apparatus adapted for sensing loads acting on a string of pipe in a well bore and comprising:

a load-bearing body adapted for coupling between adjacent sections of a pipe string;

an elongated load-responsive member having opposite end portions respectively secured to spaced portions of said load-bearing body and cooperatively arranged for normally maintaining said load-responsive member in tension and an unrestrained intermediate portion adapted to contract and elongate in response to increases and decreases in loads imposed on said load-bearing body tending to move said spaced body portions in relation to one another; and

transducer means coupled to said intermediate portion of said load-responsive member and having a measurable

characteristic adapted for varying in response to changes in the tensile forces in said load-responsive member occurring upon relative movement between said spaced body portions.

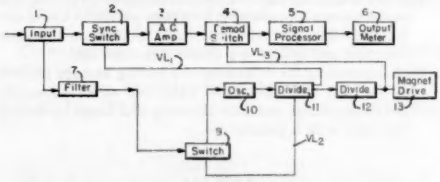


3,855,858

SELF SYNCHRONOUS NOISE REJECTION CIRCUIT FOR FLUID VELOCITY METER

Vincent J. Cushing, 9804 Hillridge Dr., Kensington, Md. 20795

Filed Aug. 1, 1973, Ser. No. 384,770
Int. Cl. G01f *1/00*; G01p *5/08*
U.S. Cl. 73—194 EM **12 Claims**



1. An electromagnetic flow meter comprising an oscillator driving an electromagnet to produce electromagnetic flux periodically reversing in polarity, elecrodes in which a signal is induced related to fluid flow and an amplifier to amplify said signal induced in said electrodes, the improvement comprising a self-synchronous niose rejection circuit including,

(a) circuit means to sense coherent noise signals in the metered fluid,

(b) second circuit means to phase lock said oscillator to said coherent noise, and

(c) means connected to said amplifier to detect, synchronously with said oscillator, said signal,

(d) whereby said coherent noise is substantially rejected.

3,855,859

FLOWMETER

Robert B. Adams, Tredyffrin Township, Chester County, Pa., assignor to Moore Products Co., Spring House, Pa.

Filed Aug. 20, 1973, Ser. No. 390,045
Int. Cl. G01f *1/00*
U.S. Cl. 73—194 B **6 Claims**

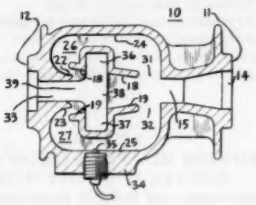
1. A fluid oscillator comprising

means directing a fluid stream therethrough and imparting to the fluid of said stream an oscillation whose frequency is directly proportional to the velocity of the fluid stream, said means including

an elongated interaction chamber bounded by a pair of spaced walls and substantially normal thereto a pair of diverging side walls for fluid jet attachment,

a nozzle at one end of said chamber for directing a fluid jet into said chamber,

a discharge passageway at the other end of said chamber through which all the fluid from said nozzle is discharged,



control ports communicating with said chamber contiguous to said nozzle, and

feedback passageways connected to said control ports from locations in said chamber upstream of said discharge passageway and downstream of said side walls,

said locations being aligned with the fluid jet attached to said side walls,

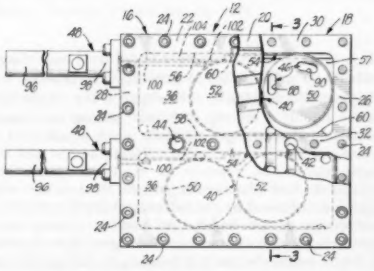
said side walls intermediate their ends having recessed regions with a transverse equalizing passageway therebetween.

3,855,860

FLUID FLOW ACTUATED DEVICE

Rex V Rhoades, 2510 San Andres Way, Claremont, Calif. 91711

Filed Feb. 1, 1973, Ser. No. 328,519
Int. Cl. G01f *3/04*
U.S. Cl. 73—243 **12 Claims**



1. A fluid flow actuated device comprising:

a pair of cylinders of rectangular cross-section each having longitudinal side walls and longitudinal guide walls normal to said side walls,

a pair of rollers within each cylinder having ends disposed in fluid sealing relation with said cylinder side walls, and diameters whose sum exceeds the spacing between said guide walls, and a flexible elastic band anchored at its ends to said guide walls, respectively, adjacent the cylinder ends and trained about said rollers in such a way that the rollers are caged by said band and movable in unison through the cylinder with pure rolling contact between the rollers and band, the roller pair in each cylinder and the corresponding elastic band constituting a pressure wall means movable through longitudinal working strokes in the cylinder,

means on said cylinders providing fluid inlet and outlet ports,

valve means controlled by the pressure wall means for selectively communicating said ports to the ends of said cylinders in a manner such that movement of the wall means of either cylinder to the end of its working stroke effects communication of said ports with the ends, respectively, of the other cylinder, whereby said wall means are driven back and forth through their working strokes alternately when said inlet port is supplied with fluid under pressure, and

transducer means connected to said pressure wall means for generating signals representing at least one of the variables (a) velocity of the pressure wall through each cylinder, and (b) the ends of said working strokes.

3,855,861

METHOD FOR MEASURING LIQUID LEVEL BY ELECTRICAL CONDUCTIVITY

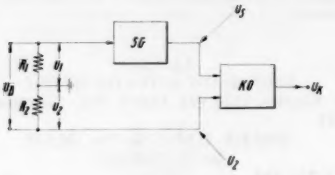
Heino Zimmermann, and Heinrich Hansemann, both of Bremen, Germany, assignors to Gustav F. Gerdts KG, Bremen, Germany

Filed Mar. 28, 1973, Ser. No. 345,815

Claims priority, application Germany, Apr. 1, 1972, 2215950

Int. Cl. G01f *23/24*

U.S. Cl. 73—304 R **3 Claims**



1. A method for measuring a liquid level according to the conductivity principle employing three electrodes, having a first electrode constantly submerged in the electrically conductive liquid; a second electrode serving as a measuring electrode and submerged partially in the liquid level; a third electrode serving as the control electrode for said first and second electrodes, wherein an electrical resistance exists between the second electrode and the third control electrode which is determined by the submerged depth and the specific conductivity of the liquid, and another electric resistance exists between the constantly submerging first electrode and the third control electrode depending on the specific conductivity of the liquid, and that both resistance values result in partial voltage drops which are compared and indicated with each other by compensating the conductivity fluctuations, comprising the steps of:

measuring separately both partial voltage drops of said first and second electrodes;

applying the (partial) voltage drop of the first electrode to a saw-tooth generator so that the amplitude of the saw-tooth electrode to a saw-tooth voltage output is equal to the voltage drop of said first electrode with respect to the third electrode in a given time span; and

applying the saw-tooth output voltage and the partial voltage drop of the second electrode with respect to the third electrode to a comparator, so that at the output of the comparator, a rectangular pulse signal is obtained having its ratio of pulse width to pulse period equalling the submerged depth.

3,855,862

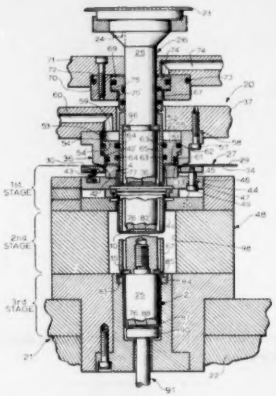
DRAW AND WALL IRON PROCESS FOR METAL CANS

Jens L. Moller, Darien, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Apr. 23, 1973, Ser. No. 353,852

Int. Cl. B21d *24/16*

U.S. Cl. 72—334 **3 Claims**



1. In a method of forming a metal container wherein a metal blank is drawn into a shallow cup having a side wall, base at one end and an opening at the other end and wherein the base and side wall are of the same thickness, comprising:

first wall ironing the side wall to elongate and thin the same and deepen the cup;

then redrawing the cup to a smaller diameter by pulling the metal transaxially inwardly and then axially to cause the metal to flow circumferentially in a hoop compressive direction and axially in a tensile direction; and

then terminating the redrawing and leaving an edge portion of the side wall about said open end as an outwardly projecting flange and then trimming said flange by cutting the same with a circular die.

3,855,863

METHOD AND APPARATUS FOR DETERMINING WET BULB GLOBE TEMPERATURE

Lorne A. Kuehn, Downsview, Ontario, and Lloyd E. McHattie, Willowdale, Ontario, both of Canada, assignors to Her Majesty the Queen in Right of Canada as represented by the Minister National Defence

Filed Dec. 19, 1973, Ser. No. 426,025

Int. Cl. G01w *1/17;* **G01k** *3/00*

U.S. Cl. 73—339 C **20 Claims**

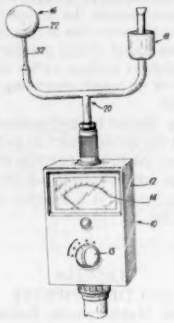
1. A method of determining the wet bulb globe temperature of surroundings including the steps of:

a. locating a wet bulb thermometer in said surroundings to provide a first signal representative of the wet bulb temperature of said surroundings,

b. locating a globe thermometer having a globe of a predetermined diameter in said surroundings to provide a second signal representative of the measured globe thermometer temperature of the surroundings, said predetermined diameter being such that the measured globe thermometer temperature closely approximates the sum of two-thirds the standard 6 inch globe temperature of said surroundings plus one-third the dry bulb temperature of said surroundings,

c. applying a weighting factor of 0.7 to said first signal to provide a fourth signal,

d. applying a weighting factor of 0.3 to said second signal to provide said third signal,
e. electronically summating said third and fourth signals to provide a weighted summation signal,



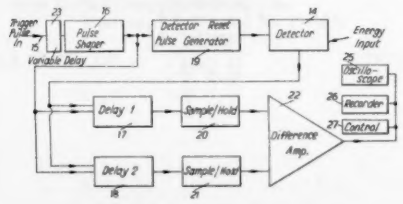
f. comparing said weighted summation signal with a reference signal to provide a fifth signal corresponding to the difference therebetween, and
g. providing said fifth signal to indicator means whereby an indication is obtained corresponding to the wet bulb globe temperature of said surroundings.

3,855,864

RADIATION PYROMETERS

Joseph Douglas, Derby, England, assignor to Rolls-Royce (1971) Limited, London, England

Filed July 2, 1973, Ser. No. 375,933
Claims priority, application Great Britain, July 6, 1972, 31585/72
Int. Cl. G01j *5/34*; **H01g** *7/02*, *7/04*
U.S. Cl. 73—355 R **12 Claims**



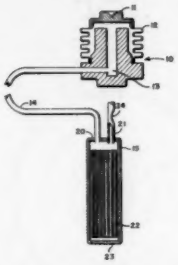
1. A radiation pyrometer adapted to produce an output signal which is proportional to the intensity of incident radiation comprising radiation detector means, detector charging means, and detector potential differentiating means, said detector charging means being adapted to charge said radiation detector means to a predetermined electrical potential at regular time intervals whereby a series of signals is obtained from the radiation detector means in a period of time, said radiation detector means being adapted to produce, upon receipt of said radiation, an electromotive force acting in opposition to said potential, and said differentiating means being adapted to produce a difference signal substantially proportional to the rate of change of said detector potential with respect to time, said difference signal also being the aforementioned output signal.

3,855,865

TEMPERATURE SENSING APPARATUS HAVING A GAS ADSORBING ELEMENT CONTAINED IN THE SENSING BULB

Hiroyuki Kishimoto, Yokohama, and Eiichi Morozumi, Fujisawa, both of Japan, assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 15, 1973, Ser. No. 416,303
Claims priority, application Japan, Nov. 22, 1972, 47-134642
Int. Cl. G01k *5/42*
U.S. Cl. 73—368.2 **2 Claims**



1. A temperature sensing device, comprising
a temperature sensing bulb,
a gas adsorbing element formed by attaching an adsorbing material to a support member, said element being enclosed in said bulb;
a pressure receiving output means,
means operably connecting said bulb to said output means, and
a gas sealed in said closed space of said bulb, and output means,
said gas adsorbing element being formed by tightly and cylindrically coiling a sheet of aluminum foil having on at least one side a porous oxide coating by alumina treatment is retained in said sensing bulb.

3,855,866

THERMOMETER READOUT MEANS

Josef F. Klinger, and John Mark Terrill, both of Wilmette, Ill., assignors to Thermex, Inc., Chicago, Ill.

Filed July 6, 1972, Ser. No. 269,501
Int. Cl. G01k *1/06*
U.S. Cl. 73—372 **13 Claims**

1. In a thermometer having a reservoir bulb defining an insertion portion to be inserted into a body orifice and a stem formed of resilient material defining a reading portion substantially rectangular in transverse cross section exposed exteriorly of the body orifice when said insert portion is inserted thereinto, said bulb being sealingly fitted to one end of said stem, said stem defining a capillary bore opening to said reservoir bulb, indicator liquid in the reservoir bulb and defining a column extending into said capillary bore responsive to temperature changes to provide a variable positioning of the top of the column, and scale means on the stem reading portion, readout means providing a maintained location indication of said column top corresponding to a reading temperature notwithstanding a subsequent lowering of said column top therefrom due to subjecting the thermometer to a temperature lower than the reading temperature prior to effecting the reading of the thermometer, said readout means comprises a molded plastic flanged element partially surrounding the stem and having a reference indicator and being readily adjustably positionable on the stem reading portion to align said reference indicator accurately with said column top while said insert portion of the stem is retained in the body orifice, said

element having a mounting slot complementary to said stem reading portion providing a sliding frictional fit of said element on said stem reading portion, said element further having a convex protuberance for facilitated fingertip manipulation thereof in effecting the adjustable positioning on said stem, said protuberance defining a magnifying lens providing

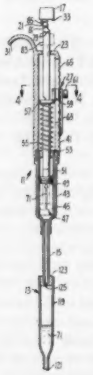
a magnified image of said reference indicator, said column top, and said scale, the resiliency of the stem serving to maintain said element in the adjusted position to provide a maintained indication of the sensed temperature notwithstanding a subsequent change in the position of said column top upon removal of the insert portion from the body orifice.

3,855,867

LIQUID TRANSFER PIPETTING DEVICE

William J. Roach, Foster City, Calif., assignor to Oxford Laboratories, Inc., Foster City, Calif.

Filed Aug. 21, 1972, Ser. No. 282,321
Int. Cl. B01l 3/02
U.S. Cl. 73—425.6 **15 Claims**



1. In a hand-held pipetter comprising an elongated barrel shaped handle, a piston chamber within said barrel, means at one end of said barrel for holding a disposable tip and for providing fluid communication between said piston chamber and an interior portion of said tip, a piston in said piston chamber, a plunger operably communicating at one end thereof with said piston and extending out of said barrel to a free end thereof through an aperture at another end of the barrel thereby to permit operation of said piston for displacing fluid within said piston chamber by moving the free end of the plunger, and spring means normally urging said piston and plunger toward said another end of the barrel, the improvement comprising:

means providing two positive stops of the plunger relative to the barrel shaped handle for selectively limiting travel of the piston with respect to the piston chamber, whereby fluid displacement within the piston chamber is accurately determined by selection of one of said two positive stops for limiting travel of said plunger and piston,

a collar on said plunger portion within said barrel handle,

a slot oriented with its length extending along a length of said handle, and

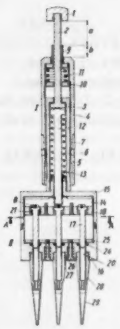
an adjustable stop carried by and manually movable along the slot to limit the spring return of said plunger collar to a predetermined position engaging the stop, said stop including means operable from outside the handle to fix the stop to the handle at a selected position along the length of said slot.

3,855,868

MULTIPLE PIPETTE

Osmo A. Sudvaniemi, Makitorpantie, Helsinki, Finland

Filed Jan. 30, 1973, Ser. No. 328,054
Claims priority, application Finland, Mar. 20, 1973, 358/72; Mar. 20, 1973, 1670/72
Int. Cl. B01l 3/02
U.S. Cl. 73—425.6 **6 Claims**



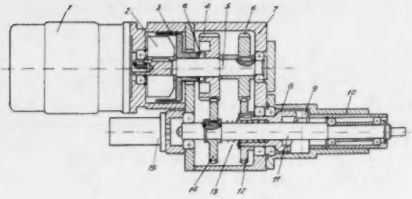
1. A multiple pipette comprising a body, a piston rod disposed within the body, a push button attached to one end of the piston rod, a plurality of containers for holding liquid, a plurality of cylinders connected to the containers, a plurality of pistons within the cylinders, a plurality of O-rings surrounding the pistons, spiral spring means surrounding the piston rod for returning it to a position in which the containers are filed after the push button has been pressed, and connecting means for connecting the pistons to the cylinders while permitting sideways movement of the pistons, the connecting means including connecting spring means that restrains axial movement of the pistons in relation to the piston rod, said connecting spring means having a force that exceeds the friction force of the O-rings.

3,855,869

DRIVEN ROTATABLE AND RECIPROCABLE SPINDLE OPERATING IN CYCLES OF SHORT DURATION

Lyudmil Vasilev Dimitrov, 40, Boul, Praga, Bulgaria

Filed Dec. 11, 1972, Ser. No. 314,256
Claims priority, application Bulgaria, Dec. 10, 1971, 19212
Int. Cl. F16h 27/00
U.S. Cl. 74—22 R 7 Claims



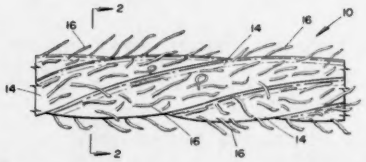
1. A driven spindle head adapted to be repeatedly operated in cycles of short duration, comprising a spindle, means mounting the spindle for rotation about its longitudinal axis and reciprocation along its longitudinal axis, a constantly rotating driving means, an end cam disposed coaxial of the spindle, means mounting the cam in a fixed position along its axis and for rotation about its axis, a transmission means connecting the driving means to the cam so as constantly to rotate the cam, a cam follower affixed to the spindle and cooperating with the cam to reciprocate the spindle when the cam rotates relative to the spindle, and means selectively to rotate the cam and spindle at the same speed and to rotate them at different speeds.

3,855,870

POWER TRANSMISSION BELT, REINFORCEMENT AND PROCESS

Werner D. Schnackenberg, Englewood, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed July 2, 1973, Ser. No. 376,037
Int. Cl. F16g 5/00
U.S. Cl. 74—234 11 Claims



1. In a power transmission belt having a body section, the improvement comprising:

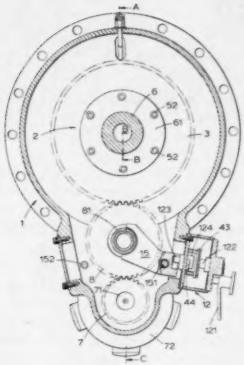
a tensile section of cord disposed in the body section, the cord including twisted multifilaments and a plurality of disassociated filaments defining end portions extending exteriorly of the cord into the body section forming a mechanical bond therewith.

3,855,871

CHAIN TENSIONING DEVICES AND DRIVE ASSEMBLIES FOR MINING

John Gibson, Newton Aycliffe, and James Nelson, Shiney Row, both of England, assignors to Underground Mining Machinery Limited, Durham, England

Division of Ser. No. 266,309, June 26, 1972, abandoned. This application Feb. 7, 1974, Ser. No. 440,299
Int. Cl. F16h 7/12
U.S. Cl. 74—242.1 FP 7 Claims



1. A mineral mining installation including a conveyor, at least one chain extending therealong, and a drive assembly for circulating said chain, said drive assembly being mounted to said conveyor and comprising;

a. a chain drum around which said chain passes;

b. a main drive motor; and

c. a transmission system drivably interconnecting said drive motor and said chain drum, said motor driving said chain drum through said transmission system at a predetermined normal operating speed, said transmission system comprising at least;

i. a transmission shaft carrying a first toothed gear;

ii. means for driving said chain drum at a reduced speed for chain tensioning and slackening operations, said driving means comprising;

A. an auxiliary motor having a drive shaft carrying a second toothed gear;

B. an intermediate toothed gear shiftable between a first position in which it transmits rotary motion between said first and second toothed gears and a second position in which said first and second toothed gears are out of drivable engagement;

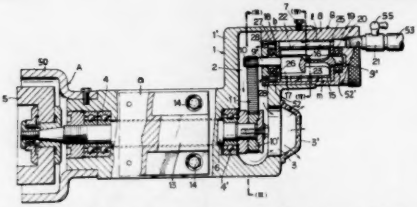
C. shifting means operable to move said intermediate gear between the two said positions to selectively transmit rotary motion from said auxiliary motor through said transmission system to said chain drum; and

D. a housing supporting at least said auxiliary motor, said second toothed gear and said intermediate toothed gear, said housing being readily detachable from the remainder of said drive assembly.

3,855,872
ROTARY DRIVE APPARATUS

Masakazu Kakimoto, 78, Azaooshima Ooazaasada, Nisohincho, Aichi-ken, Japan

Filed Aug. 29, 1973, Ser. No. 392,927
Claims priority, application Japan, Dec. 28, 1972, 48-1929; Feb. 14, 1973, 48-18203
Int. Cl. F16h *7/10*
U.S. Cl. 74—242.16 **10 Claims**

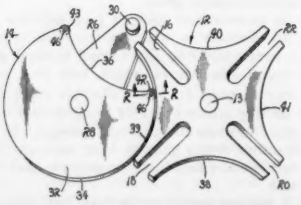


1. A rotary drive apparatus comprising a housing including an intermediate transmission portion, an input shaft portion connected to one end of said intermediate transmission portion and extending outwardly therefrom in a first direction, an output shaft portion connected to the opposite end of said intermediate transmission portion and extending outwardly therefrom in a second direction opposite to the first direction, an air motor exhaust port located in said housing adjacent said output shaft portion, an air motor having a rotatable drive shaft with a driven end projecting into said intermediate transmission portion of said housing and having a drive pulley affixed thereto, support means rotatably supporting said air motor in said input shaft portion with said drive shaft being eccentrically located in respect to said support means and being shiftable upon rotation of said support means, an output shaft rotatably supported in said output shaft portion and having a driven end projecting into said intermediate transmission portion of said housing and having an output pulley affixed thereto, a drive belt engaged over said input and output pulleys for driving said output shaft by said air motor, said air motor having an air discharge directed into said intermediate transmission portion of said housing for flow along said housing and exhaust at the opposite end through said exhaust port, said support means being rotatable to change the spacing between said output and input shafts in order to adjust the tension of said belt.

3,855,873
GENEVA MECHANISM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect of an invention of; Robert H. Summers, and Ralph L. Kenney, both of Pasadena, Calif.

Filed Nov. 2, 1973, Ser. No. 412,079
Int. Cl. F16h *55/04;* **B23q** *17/02*
U.S. Cl. 74—436 **4 Claims**



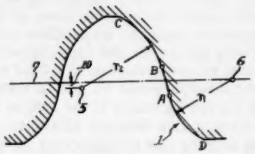
1. In a Geneva mechanism characterized by a star-wheel having a plurality of uniformly disposed, radially extended drive slots and a segmented cam-follower surface including a plurality of uniform, incurvated segments interposed between the drive slots, and a star-wheel driver comprising a driving arm and a juxtaposed restraining cam having a segmented cam surface contiguously related with the segmented cam-follower surface and including an excurvated segment having a radius of curvature substantially equal to the radius of the incurvated segments of said cam-follower surface for sequentially engaging segments of the cam-follower surface, the improvement comprising:

friction reduction means interposed between the cam surface and the cam-follower surface adjacent to each end portion of said excurvated segment of the cam surface.

3,855,874
DOUBLE MESH TYPE W-N GEAR

Seishi Honma, Yokohama, and Yoshihisa Fujii, Tokyo, both of Japan, assignors to Kabushiki Kaisha Hasegawa Haguruma, Tokyo, Japan

Filed July 12, 1973, Ser. No. 378,786
Claims priority, application Japan, July 26, 1972, 47-74210
Int. Cl. F16h *55/06*
U.S. Cl. 74—462 **7 Claims**



1. A double mesh type W-N gear with a basic rack on a transverse plane or on a normal plane characterized in that modifications are introduced so that the two points of contact between the mating tooth surfaces are shifted respectively in a direction away from the pitch line so as to give a pressure angle of not less than 30° thereby to obtain an increased clearance between intermediate straight portions of the mating profiles, the gear teeth profiles each including circular addendum and dedendum arcs connected by an intermediate straight line segment at the pitch line area, the arcs being of different radii centered on the pitch line or on points adjacent thereto, the two points of contact on one gear tooth being one on the addendum and one on the dedendum arc for contact with a gear tooth on the other gear.

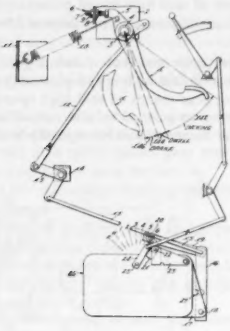
3,855,875
CLUTCH PEDAL OPERATED DOWN SHIFTING MECHANISM

Kenneth N. Hansen, Waukesha, Wis., assignor to Allis Chalmers, Milwaukee, Wis.

Filed Dec. 20, 1972, Ser. No. 316,998
Int. Cl. G05g *11/00;* **F16d** *67/02*
U.S. Cl. 74—481 **10 Claims**

1. A vehicle clutch and shift mechanism for a vehicle transmission including, a pedal, a hydraulic clutch actuating valve adapted for operating a vehicle clutch, a hydraulic clutch actuating linkage connected between said pedal and said valve for operating said valve with said pedal, a shift control adapted for operating a multiple speed power shift transmission including, a speed range shift lever for shifting the transmission through a plurality of speed ranges, a manual control lever means connected to said speed range shift lever, a cam means connected to said hydraulic clutch actuating linkage and

engaging said shift lever to bias said shift lever to the lower speed range positions when said clutch pedal operates said



hydraulic valve to throttle hydraulic fluid for limited slippage of the vehicle clutch.

3,855,876

TELESCOPIC SAFETY STEERING COLUMN FOR MOTOR VEHICLES

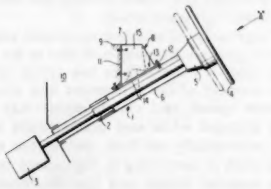
Wilhelm Albrecht, Vaihingen, and Helmut Wulf, Nellingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed May 4, 1973, Ser. No. 357,084

Claims priority, application Germany, May 4, 1972, 2221760

Int. Cl. B62d *1/18*

U.S. Cl. 74—492 **4 Claims**



1. A telescopic safety steering column for motor vehicles which includes an outer column means, a steering wheel displaceable relative to the outer column means under energy absorption, the improvement comprising an energy absorbing connection means for connecting the outer column means with a front part of the vehicle, said energy-absorbing connection means from the outer column means to the vehicle front part being relatively soft in bending in the impact direction of a body, said energy-absorbing connection means including a structural member stressed in tension so as to render said energy-absorbing connection means form-stable in an opposite direction, and a vehicle cross bearer means provided with notch means, said notch means being covered off on the outside by said structural member, said structural member being composed of a material having a relatively high tensile strength.

3,855,877

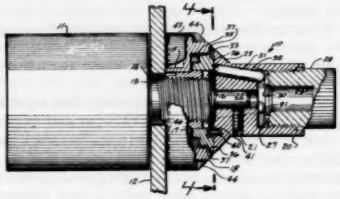
LOCKING KNOB

Donald R. Gach, La Verne, Calif., assignor to Robert L. Gach, aka Kilo Engineering Company, La Verne, Calif.

Continuation-in-part of Ser. No. 250,280, May 4, 1972, abandoned. This application June 28, 1973, Ser. No. 374,798

Int. Cl. G05g *5/06*

U.S. Cl. 74—531 **9 Claims**



1. A locking knob assembly for driving a rotatable shaft of a device, comprising:

a base having a portion adapted for attachment to the device to be stationary with respect to the shaft;

a knob disposed adjacent the base and adapted to be rigidly secured to the shaft to be rotatable with respect to the base;

a locking member mounted on the knob to be movable with respect to the knob toward and away from the base; and braking means disposed between the locking member and base, and arranged to be driven by the locking member into frictional engagement with the base when the locking member is moved with respect to the knob whereby the knob and shaft can be secured at a desired rotational position.

3,855,878

TRANSMISSION SYSTEMS

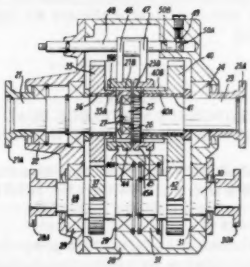
Hubert Steiner, Longton, England, assignor to H. Steiner Limited, Staffordshire, England

Filed Mar. 16, 1973, Ser. No. 342,225

Claims priority, application Great Britain, Mar. 24, 1972, 14022/72

Int. Cl. F16h *37/06*

U.S. Cl. 74—665 Q **10 Claims**



1. A gearbox comprising:

a. a housing

b. four shafts rotatably supported by said housing, said shafts including a main input shaft, a main output shaft, an auxiliary input shaft, and an auxiliary output shaft,

c. a single control means movable between two operative positions, and

d. means responsive to movement of said control means into one of its operative positions for simultaneously:

I. connecting said main input shaft to said main output shaft,

II. disconnecting said main input shaft from said auxiliary output shaft, and

III. disconnecting said auxiliary input shaft from said main output shaft,

and responsive to movement of said control means into the other of its operative positions for simultaneously:

I. connecting said main input shaft to said auxiliary output shaft,

II. connecting said auxiliary input shaft to said main output shaft, and

III. disconnecting said main input shaft from said main output shaft.

9. A gearbox or transfer box having a first input shaft, a first output shaft co-axial with the first input shaft, a gear mounted on each said shaft, splines provided on each said shaft, a second output shaft, a gear mounted on said second output shaft and in constant mesh with said gear mounted on said first input shaft, a second input shaft, a gear mounted on said second input shaft and in constant mesh with said gear mounted on said first output shaft, one of each pair of intermeshing gears being rotatably mounted on its shaft, splined collars associated with the splines on said first input shaft and first output shaft and with each of said rotatably mounted gears, said collars being interconnected by control means for movement between a first position in which:

a. said first input shaft is connected to said first output shaft,

b. said second input shaft is not connected to said first output shaft; and a second position in which:

c. said first input shaft is connected to said second output shaft,

d. said first input shaft is not connected to said first output shaft.

10. A gearbox or transfer box having a first input shaft, a first output shaft co-axial with the first input shaft, a gear rotatably mounted on each said shaft, splines provided on each said shaft, a second output shaft, a gear non-rotatably mounted on said second output shaft and in constant mesh with said gear mounted on said firt input shaft, a second input shaft, a gear non-rotatably mounted on said second input shaft and in constant mesh with said gear mounted on said first output shaft, a pair of splined collars slidably mounted on the splines of said first input shaft and first output shaft, said collars being interconnected by control means for movement between a first position in which the splines on said first input shaft and said first output shaft are drivingly interconnected and the gears on the respective shafts are freely rotatable thereon and a second position in which said gears are non-rotatably coupled to their respective shafts for rotation therewith and the splines of said shafts are no longer drivingly interconnected.

3,855,879

SYNCHRONOUSLY SHIFTABLE DUAL RANGE PLANETARY TRANSMISSION WITH COAXIAL INPUT SHAFTS

George M. DeLalio, 81 Gazza Blvd., Farmingdale, N.Y. 11735

Filed Dec. 22, 1972, Ser. No. 317,528

Int. Cl. F16h *47/04*, *37/06*

U.S. Cl. 74—687 14 Claims

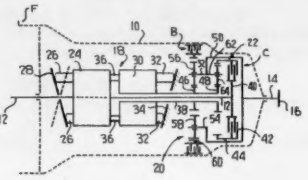
1. A power transmission for use with power input means for imparting rotary drive to the transmission, comprising in combination:

an input quill shaft and an inner shaft coaxial therewithin in which said inner shaft projects beyond said quill shaft at either end thereof;

low speed planetary gear means and high speed planetary gear means each centered about said input shafts and including sun gear input means connected to said quill shaft for continuously imparting one input path to both of said planetary gear means; said low speed planetary gear means also including third-element gear means and planet gear means for reacting between said sun gear input means and the said third-element gear means and said high speed planetary gear means also including third-element gear means and planet gear means for reacting between said sun gear input means and the third-element gear means of said high speed planetary gear means;

an output shaft aligned with but disposed beyond said input shafts;

one of the two gear means constituted by said third-element gear means of said high speed planetary gear means and said planet gear means of said high speed planetary gear means being connected to said output shaft and to said planet gear means of said low speed planetary gear means



whereby said output shaft is capable of connection to said sun gear input means through either of said low speed and said high speed planetary gear means and a continuous drive coupling is effected between said low speed and said high speed planetary gear means;

a hydrostatic drive unit comprising a driving member mechanically connected to said power input means and a rotatable driven member connected to said input quill shaft and including means for infinitely varying the rotational speed of said driven member between first and second maximum speeds which are of opposite rotational sense with respect to each other and of maximum sense with respect to the rotational speed of said driving member;

brake means for selectively braking said third-element gear means of said low speed planetary gear means to prevent rotation thereof and establish low speed drive; and

clutch means for selectively coupling said power input means to the other of said two gear means of the high speed planetary gear means through said inner input shaft to establish high speed drive;

and the gear ratios of said low speed and said high speed planetary gear means being such that as the speed of said output shaft is increasing in low speed range and said driven member of the hydrostatic unit attains said first maximum speed, said clutch means may be synchronously engaged while said brake means is disengaged under substantially no load, and as the speed of said output shaft is decreasing in high speed range and said driven member attains said first maximum speed, said clutch means may be synchronously disengaged while said brake means is engaged under substantially no load.

11. A synchronously shiftable, extended range transmission comprising, in combination:

a quill shaft and an input shaft coaxial within said quill shaft with said input shaft having an end portion projecting from said quill shaft;

a high speed planetary gear set surrounding said quill shaft adjacent that end thereof from which said inner shaft projects;

a low speed planetary gear set surrounding said quill shaft to that side of said high speed planetary gear set away from said end portion of the input shaft;

said low speed planetary gear set including a low speed planetary ring gear and low speed planet gear means meshing therewith and including a planet gear carrier, and sun gear means for rotatably driving said planet gear

carrier;

said high speed planetary gear set comprising a high speed planetary ring gear and high speed planet gear means meshing therewith, and said sun gear means meshing with said high speed planet gear means;

an output shaft coaxial with said input and quill shafts but disposed in spaced relation to said end portion of the input shaft;

said planet gear carrier enclosing said high speed planetary gear set and being connected directly to said output shaft, one of said high speed planetary ring gear and said high speed planet gear means being carried by said planet gear carrier;

clutch means for selectively coupling said end portion of the input shaft to that one of said high speed planetary ring gear and said high speed planet gear means which is not carried by said planet gear carrier;

brake means for selectively braking said low speed planetary ring gear;

a hydrostatic pump connected to said input shaft remote from said end portion thereof and adapted to be driven in fixed ratio from a prime mover and including swash plate means for selectively varying the quantity of fluid displaced by said pump; and

a hydrostatic motor fixed to said quill shaft remote from said end portion of the input shaft and connected to said pump for infinitely variable driven ratio with respect thereto.

3,855,880

HYDRAULIC PRESSURE CONTROL SYSTEM FOR AN AUTOMATIC POWER TRANSMISSION

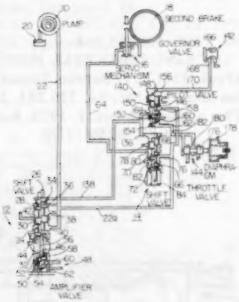
Wataru Ishimaru, and Toshiyuki Miyauchi, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 269,301, July 6, 1972, abandoned. This application Apr. 12, 1974, Ser. No. 460,472

Claims priority, application Japan, Nov. 26, 1971, 46-95024

Int. Cl. B60k *21/00*

U.S. Cl. 74—868 **2 Claims**



1. A control system for controlling the level of hydraulic pressure supplied to a servo mechanism of a friction element of an automotive automatic power transmission driven by an engine comprising, in combination, a source of hydraulic pressure, a first conduit means hydraulically connected to said source of hydraulic pressure, a regulator valve communicating with said source of hydraulic pressure through said first conduit means and having a valve spool for controlling the level of the hydraulic pressure, a branch conduit hydraulically connected to said first conduit means and communicating with said regulator valve therethrough, a shift valve hydraulically connected to said branch conduit and having a valve spool for controlling the supply of hydraulic pressure to be supplied to said servo mechanism, the movements of the valve spool of said shift valve being controlled by the hydraulic pressure exerted on the valve spool of said shift valve, and a second conduit means hydraulically connected between said shift valve and said regulator valve, said second conduit means passing the hydraulic pressure to be exerted on the valve spool of said shift valve to said regulator valve which hydraulic pressure acts on the valve spool of said regulator valve, whereby the valve spool of said regulator valve is moved in a direction to reduce the level of the hydraulic pressure to be supplied to said servo mechanism simultaneously with the actuation of the valve spool of said shift valve for thereby effecting smooth engagement of said friction element, further comprising an actuating means associated with said shift valve for controlling the hydraulic pressure to be exerted on the valve spool of said shift valve for thereby controlling the movements of the valve spool of said shift valve, wherein said shift valve has a port which is hydraulically connected to said second conduit means, wherein said actuating means includes a pilot valve hydraulically connected between said branch conduit and said second conduit means and having a valve spool to control the hydraulic pressure to be admitted to the port of said shift valve, further comprising first sensing means to sense vehicle speed and a second sensing means to sense on output torque of said engine, and wherein said first sensing means includes a hydraulic governor valve adapted to produce a first pressure signal in dependence on the vehicle speed, said hydraulic governor valve communicating with said pilot valve for applying said first pressure signal on one end of the valve spool of said pilot valve, and wherein said second sensing means includes a throttle valve adapted to produce a second pressure signal in dependence on the output torque of said engine, said throttle valve communicating with said pilot valve for applying said second pressure signal on the other end of the valve spool of said pilot valve.

3,855,881

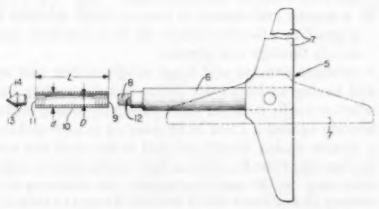
TOOL FOR INSERTING A REPAIR PLUG AND PATCH IN A WIRE CORD TIRE

Paul S. Buckland, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed June 28, 1973, Ser. No. 374,707

Int. Cl. B60c *25/16*

U.S. Cl. 81—15.7 **2 Claims**



1. A tool used in positioning a combination plug-patch required for repairing a puncture in a tire, comprising:

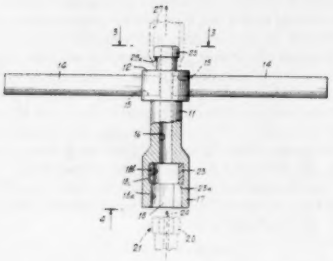
a. an elongated, hollow, cylindrically shaped, rigid sleeve having an inside diameter which is uniform from end-to-end of the sleeve and sized to receive the plug of the plug-patch, the sleeve having opposing ends which are internally threaded;

b. a pointed tip insertable in at least one of the opposing ends of the sleeve to provide a pointed sleeve end for entry into the puncture;

c. means for gripping the tool, by hand, such that the sleeve can be pushed into the puncture in the tire and then pulled therefrom in the same axial direction as the sleeve is pushed into the puncture, said means including:

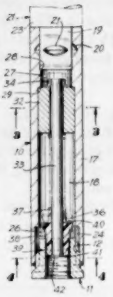
I. an elongated body having opposing ends;
II. a handle disposed at one end of the body in angular relation to the longitudinal axis of the body;
III. means disposed at the other end of the body for threadably engaging the internally threaded ends of the sleeve, said means including an externally threaded end; and
IV. an abutment carried by the body adjacent the threaded end of the body for engaging the cylindrical sleeve to limit threaded engagement between the sleeve and tool gripping means.

3,855,882
BLEED WRENCH
Raymond H. Wittmann, Bay Shore, N.Y., assignor to Sid Harvey Manufacturing Co., Inc., Garden City, N.Y.
Filed Apr. 4, 1973, Ser. No. 347,671
Int. Cl. B25b *13/48*
U.S. Cl. 81—121 R **4 Claims**



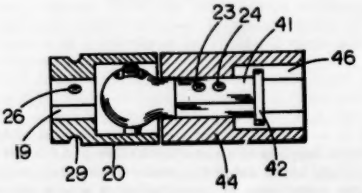
1. For use with a bleed valve or the like having a rotatable and externally grippable valve head controlling discharge of fluid through an orifice disposed axially of the head, a wrench comprising
a. a rigid, integral axially rectilinear shaft having
i. an axial bore,
ii. an enlarged first end forming a socket coaxial with and communicating with said bore, said socket including an outer portion shaped to receive and grip said valve head for rotation therewith, and
iii. a second end shaped to form a nipple adapted to be gripped by a flexible tube or the like, said bore opening axially through said nipple;
b. a resilient annular seal fitted snugly within said socket and having an outwardly facing annular sealing surface offset inwardly from the outer extremity of said socket for bearing against a valve head inserted in said socket; and
c. handle means, fixedly secured to the shaft and extending laterally from the shaft at right angles thereto intermediate said socket and said nipple, for effecting manual turning of said shaft about the axis thereof to turn a valve head received within said socket for opening said valve, said bore being adapted to conduct fluid discharged from said valve to a tube secured to said nipple;
d. said socket further including an inner portion wider than said outer portion such that an inwardly facing shoulder is formed in the socket at the junction of the outer and inner portions, said inner portion terminating inwardly in an outwardly facing surface through which said bore opens, said last-mentioned surface being spaced inwardly from said shoulder;
e. said seal having an outer diameter greater than that of said outer socket portion and an inner diameter smaller than that of said outer socket portion, said seal being inserted within said inner socket portion and there retained by said shoulder, said seal further having an axial dimension about equal to the spacing between said shoulder and said outwardly facing surface of said inner socket portion for fitting snugly between said shoulder and said last-mentioned surface.

3,855,883
NUT RETAINING SOCKET WRENCH
Howard C. Stumpf, 1238 Salem St., Malden, Mass. 02148, and Daniel A. Laskey, 329 Lincoln Ave., Saugus, Mass.
Filed Nov. 7, 1973, Ser. No. 413,641
Int. Cl. B25b *13/02*
U.S. Cl. 81—125 **6 Claims**



1. A nut retaining wrench comprising a longitudinally extending body member having a nut engaging socket in its distal end, a nut bore-engaging retainer mounted in said body member coaxial with said socket and axially movable between an advanced position proximate the distal end of said socket and a retracted position rearwardly of said advanced position, and means resiliently urging said retainer member toward its advanced position, wherein said bore-engaging retainer member comprises a plug coaxial with said socket and tapering inwardly toward the distal end thereof, said plug being formed of a compressible material.

3,855,884
LOCKING UNIVERSAL JOINT
Warren L. McPeak, 3341 N. El Burrito, Tucson, Ariz. 85705
Continuation-in-part of Ser. No. 320,203, Jan. 2, 1973, abandoned. This application Oct. 1, 1973, Ser. No. 402,264
Int. Cl. B25b *13/00*
U.S. Cl. 81—177 UJ **6 Claims**



1. A locking universal joint comprising:
a body at one end thereof;
a socket at the body end of the universal joint, serving as an input terminal;
first means at the other end of the universal joint comprising a shaft having a non-circular cross section and terminating at the end distant from the said body in a washer, the outside diameter of the washer being greater than the minimum diameter of the cross section of the shaft;

an element slideable on said shaft, bearing on the end distant from said body a shaped recess serving as an output terminal and termed a wrench socket; and

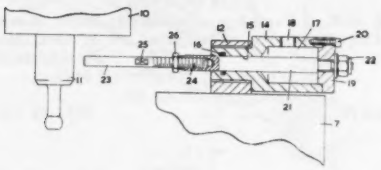
second means removably locking said element in either of two positions on said first means.

3,855,885

ADJUSTABLE STOP MEANS

Struan Robertson Lockhart Marshall, 20 Elmdene Rd., Kenilworth, England

Filed Jan. 18, 1974, Ser. No. 434,552
Int. Cl. B23b *3/36*
U.S. Cl. 82—34 B **5 Claims**



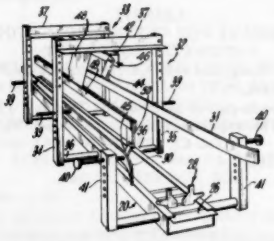
1. A stop means for limiting travel of one component relatively to another comprising a member securable to one of the components, a probe arranged to be engaged by the other component to limit its travel, the member and probe being respectively connected to a part defining a hollow cavity, said connections being spaced lengthwise of said part, the cavity having an entry port for fluid which in use is at the temperature of at least one of the components, and the part being of a material having a relatively high coefficient of thermal expansion, whereby the distance between the member and the operative end of the probe, in the direction of the length of the part, varies in accordance with the temperature of the fluid.

3,855,886

CONDUIT-SLITTING METHOD

Theodore E. Andrews, Kutztown, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Division of Ser. No. 282,653, Aug. 22, 1972, Pat. No. 3,799,012. This application June 22, 1973, Ser. No. 372,699
Int. Cl. B26d *1/02*
U.S. Cl. 83—7 **6 Claims**



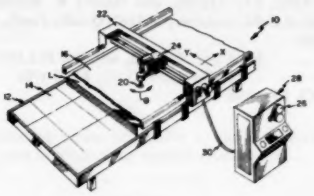
1. The method of longitudinally dividing a flexibly sheathed tubular workpiece into hinged semicylindrical halves, which comprises first radially outwardly slicing the workpiece wall on a longitudinal alignment locally proximate to the desired hinge axis and to a radial extent short of severing the sheath, and thereafter radially slicing a diametrically opposite locale of the entire workpiece wall on a longitudinal alignment parallel to said first alignment, whereby at the local region of first slicing action the local integrity of the remaining circumferential extent of the workpiece body provides a stabilizing action to assist in accurate control of said radial extent, so that hinge action cannot be available until a point in time after completion of the entire first-slicing action.

3,855,887

METHOD FOR CUTTING PATTERN PIECES FROM SHEET MATERIAL

David R. Pearl, West Hartford, and Samuel Clifford Robinson, Manchester, both of Conn., assignors to Gerber Garment Technology, Inc., East Hartford, Conn.

Division of Ser. No. 314,144, Dec. 11, 1972, Pat. No. 3,803,960. This application Feb. 6, 1974, Ser. No. 440,076
Int. Cl. D06h *7/00;* **B26d** *1/10*
U.S. Cl. 83—49 **2 Claims**



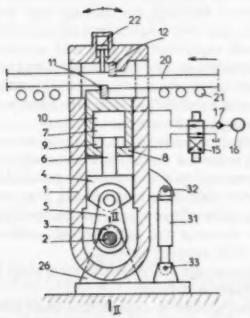
1. A method of cutting closely spaced pattern pieces in limp sheet material comprising the steps of: advancing a cutting blade in the sheet material in a given direction about a pattern piece and along a cutting path defined by the pattern piece contour; maintaining the cutting blade in a generally tangent position relative to the cutting path at each point along the path; and turning the advancing cutting blade slightly out of the tangent position and away from an adjacent, previously cut contour as the advancing blade approaches the adjacent contour.

3,855,888

CUTTING EQUIPMENT FOR A MULTI-LINE CONTINUOUS CASTING PLANT

Pierre Gay, La Tour En Jarez, France, assignor to Creusot-Loire Enterprises, Paris, France

Filed Nov. 26, 1973, Ser. No. 418,949
Claims priority, application France, Dec. 8, 1972, 72.43720
Int. Cl. B23d *25/06*
U.S. Cl. 83—303 **7 Claims**



1. Cutting equipment for a multi-line continuous casting plant comprising:

1. a plurality of shears each comprising:
   a. a frame,
   b. cutting blade means,
   c. means for mounting said cutting blade means in said frame,
   d. a shaft,

e. means for coupling said shaft to said cutting blade means for causing said blade means to perform a cutting motion on rotation of said shaft,

f. means for mounting said frame on said shaft for angular movement relative thereto, and

g. means for adjusting the angular position of said frame relative to said shaft;

2. means for coupling said shafts of said shears for co-rotation, said shafts being aligned, and

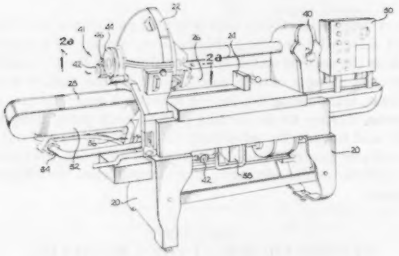
3. drive means common to said shafts for driving said shafts.

3,855,889

SLICER

Ron Wiley, Los Angeles, and Harvey R. Searing, Glendale, both of Calif., assignors to Leo's Quality Foods, Los Angeles, Calif.

Filed Dec. 4, 1972, Ser. No. 312,109
Int. Cl. B23d *25/02*; B26d *4/04*
U.S. Cl. 83—490 **3 Claims**



1. In a slicing machine, an improved knife drive comprising a first structure supported on first and second main support bearings for rotation about a first longitudinal axis defined by said bearings, said first structure having a means between said first and second bearings for driving said first structure in rotation about said first longitudinal axis by a first drive motor;

a central shaft supported by first and second central shaft bearings concentric to said first longitudinal axis for rotation about said first longitudinal axis, said first central shaft bearing being supported by said first structure between said first and second main support bearings;

an offset shaft supported on first and second offset shaft bearings mounted on said first structure for rotation axis about a second axis substantially parallel to and radially offset from said first longitudinal axis, said offset shaft having a knife adjacent one end thereof at a longitudinal position between the longitudinal position of first and second main support bearings;

means adjacent one end of said central shaft for driving said central shaft in rotation;

first coupling means on said central shaft between said first and second central shaft bearings for driving a flexible drive means;

second coupling means on said offset shaft between said first and second offset shaft bearings for being driven on rotation by a flexible drive means;

a flexible drive means extending around said first and second coupling means;

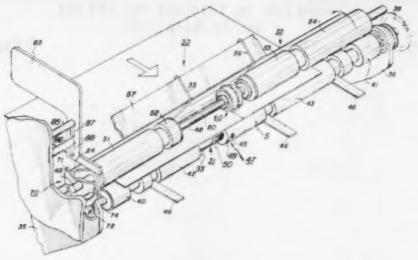
means for driving said central shaft in rotation by a second drive motor.

3,855,890

SLITTER/PERFORATOR APPARATUS

Thomas Lynch, Fairport; Douglas G. Berner, and Frank R. Hynes, both of Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 317,029, Dec. 20, 1972, abandoned. This application Dec. 17, 1973, Ser. No. 425,370
Int. Cl. B26d *3/00*
U.S. Cl. 83—331 **18 Claims**



1. An apparatus for perforating a sheet of material that is moving along a predetermined path of travel including:

a support means being arranged adjacent to the path of travel;

a first blade for operating upon said sheet mounted upon said support means, said blade being movable between an operative position in the path of travel of the sheet and an inoperative position out of the path of travel of the sheet;

a second blade for operating upon said sheet mounted upon said support means, said second blade being movable between an operative position in the path of travel of the sheet and an inoperative position out of the path of travel of the sheet, said second blade being eccentric with respect to said first blade, with the eccentricity of said blades being such that when one of said blades is positioned in the path of travel of the sheet the other of said blades is positioned out of the path of travel of the sheet;

means cooperating with said blades in their operative position for providing effective cutting or perforating action;

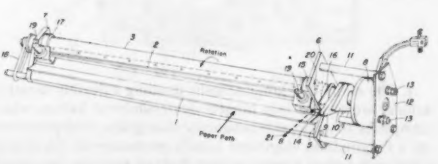
and means for positioning said blades into and out of the path of travel of the sheet.

3,855,891

KNIFE MODULE FOR CUTTING ROLL STOCK IN AUTOMATED EQUIPMENT

James Leroy Young, Endwell, N.Y., assignor to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 161,713, July 12, 1971, abandoned. This application May 7, 1973, Ser. No. 358,094
Int. Cl. B23d *17/00*
U.S. Cl. 83—582 **6 Claims**



1. An improved knife assembly including,

a stationary cutting means,

a rotary cutting means adjacent to and operable in concert with said stationary cutting means,

a pair of gauge means each disposed at opposite ends of said rotary cutting means to control the degree of contact

between said stationary cutting means and said rotary cutting means, one of said gauge means having a diameter equal to the diameter of the rotary cutting means, and the other of said gauge means having a diameter less than the diameter of said rotary cutting means,

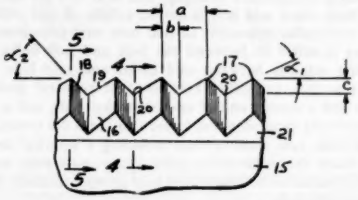
two tensioning members each positioned at opposite ends of said rotary cutting means adapted to urge said rotary cutting means to positively contact said stationary cutting means, and

an actuating means for initiating the cutting operation by providing positive motivating force to said rotary cutting means.

3,855,892
CUTTING RULE

Carmen J. DiLello, Philadelphia, and David K. Hart, Rosemont, both of Pa., assignors to Cir-Cut Corporation, Philadelphia, Pa.

Filed Mar. 7, 1973, Ser. No. 338,761
Int. Cl. B26d *1/12*
U.S. Cl. 83—835 **21 Claims**



1. In a cutting rule of the general type having an elongated flat body portion with teeth formed along at least one longitudinal edge thereof, the improvement wherein said teeth comprise a series of adjacent asymmetric teeth, each tooth having a tooth tip and first and second tooth side edges, said tooth side edges diverging from one another from the tooth tip to points of intersection with the side edges of the teeth immediately adjacent to and disposed at opposite sides of said each tooth to form tooth crotches at the said points of intersection, said first and second tooth side edges respectively intersecting a datum line at different first and second angles, and the said tips of said series of adjacent asymmetric teeth being disposed along a straight line.

3,855,893
ELECTRONIC ORGAN EMPLOYING MULTIPLE WAVEFORM TONE GENERATORS AND CHIFF GENERATORS

Willis E. Chase, Los Angeles, Calif., assignor to Chase of California, Los Angeles, Calif.

Filed Sept. 15, 1971, Ser. No. 180,563
Int. Cl. G10h *1/02, 5/02*
U.S. Cl. 84—1.24 **6 Claims**

1. In an electronic musical instrument for obtaining complex waveforms comprising in combination:

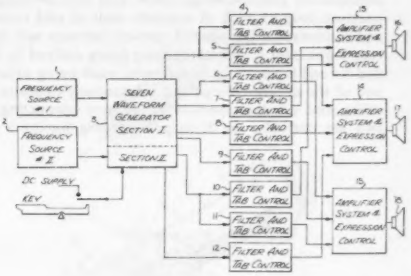
a frequency source supplying pulses continuously at a given rate;

means for modifying the waveshapes of said pulses so that each waveshape thereof has a plurality of selected harmonics;

key switching means connected to said waveshape modifying means for selectively rendering said waveshape modifying means operative;

filter means responsive to the output of said waveshape modifying means for adjusting the amplitudes of said harmonics to conform to the timbre of a given musical tone;

means responsive to said key switching means for imparting a controlled change in selected harmonics of said waveshape modifying means for the purpose of giving a starting transient to said musical tone; and

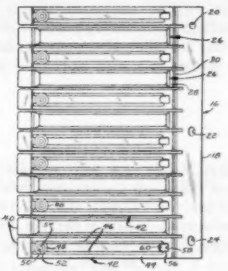


signal translating means responsive to the output of said filter means to produce an audible musical tone.

3,855,894
KEY ASSEMBLY

Howard M. Thomas, and Robert F. Olszowka, both of North Tonawanda, N.Y., assignors to The Wurlitzer Company, Chicago, Ill.

Filed May 6, 1974, Ser. No. 467,207
Int. Cl. G10c *3/12*; **G10h** *1/00*
U.S. Cl. 84—423 **13 Claims**



1. A key assembly for use as in a musical instrument keyboard comprising an elongated mounting strip for attachment to supporting structure, a plurality of keys of a first type, a plurality of flexural portions respectively integrally connecting said keys of said first type to said mounting strip, a plurality of key bars corresponding to keys of a second type, a plurality of flexible portions respectively integrally connecting said key bars to said mounting strip, and a plurality of keys of said second type respectively secured to said key bars.

3,855,895
ONE-QUARTER TURN FASTENER

Ajax C. Francis, Jr., Newark, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

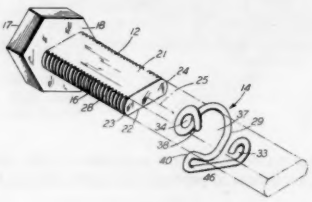
Filed Dec. 27, 1972, Ser. No. 318,789
Int. Cl. F16b *21/18*
U.S. Cl. 85—1 L **2 Claims**

1. A fastener comprising:

a. an elongated member including a head at one end thereof, and a cylindric portion extending from said head, said cylindric portion having an oblong cross section with a width between two substantially parallel surfaces and a

length between two convex, grooved surfaces, the grooves in each surface being parallel to each other and in planes substantially perpendicular to the longitudinal axis of said elongated member; and

b. a retainer of a single wire having been formed into a substantially planar configuration, said wire defining an aperture loop at each of opposite ends of said retainer and a substantially U-shaped opening between said aperture loops, said U-shaped opening being defined by first and second leg portions of said wire, each being adjacent one of the aperture loops and substantially opposite the other, and a bottom portion of the wire connecting the two leg portions, the U-shaped opening having a gap



opposite said bottom portion, said gap being defined between the first leg portion and an end of the wire extending from the aperture loop adjacent the second leg portion across said second leg portion into the U-shaped opening, said configuration permitting the elongated member to be inserted through the U-shaped opening, the gap admitting the width of the oblong cross section, the length thereof extending through the gap toward the bottom portion of the wire, such that after insertion, a quarter-turn of the elongated member engages the grooved surfaces with the leg portions of the retainer to inhibit further longitudinal movement and the end of the wire stops further rotational movement of the elongated member.

3,855,896

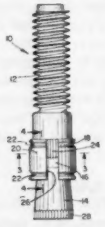
WEDGE ANCHOR

Bruce L. Kaufman, Trail Creek, Ind., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 192,491, Oct. 26, 1971, abandoned, which is a continuation-in-part of Ser. No. 56,479, July 20, 1970, abandoned. This application Sept. 14, 1973, Ser. No. 397,378

Int. Cl. F16b *13/06*

U.S. Cl. 85—78 **13 Claims**



1. A wedge anchor of a type adapted to be expanded in a predrilled hole in concrete or the like, the hole being substantially the same diameter as said anchor and said anchor fitting into the hole to be expanded therein, said anchor comprising an expansion bolt having a first section formed on a first end of the bolt, said first section including means for enabling a longitudinal force which tends to urge said bolt from the hole to be applied to said bolt, a second section formed on the bolt adjacent to the first section, said second section forming a substantially cylindrical surface coextensive with the surface of the bolt, a tapered section, a reduced diameter section between said second section and said tapered section, a one-piece split expansion collar, said split expansion collar including an integral split ring formed from a substantially rectantular, imperforate strip of metal and being positioned around said reduced diameter section, said collar having a generally annular groove defining an area of minimum thickness in cross-section proximate each axial end thereof, said groove at the axial end which rides upon the said tapered section facilitating outward swaging of the said axial end of said collar by providing a generally annular weakened area where bending occurs, said annular grooves providing a substantially symmetrical collar having axial ends which are substantially mirror images of each other whereby no particular orientation of said collar is necessary when mounting said collar on said bolt, the inner edges at each axial end of said collar including bevels which provide smooth tapers substantially about said inner edges thereby to inhibit gouging of said tapered section by said collar, said collar including at least two spaced protuberances on the outer surface thereof and extending outwardly therefrom which are adapted to engage and bear into the side wall of the hole when said bolt is moved axially of said collar to swage said collar outwardly of said bolt, said protuberances enabling a better fit between the hole and said collar and inhibiting rotation between said collar and said hole, said tapered section extending between said reduced diameter section and a second end of said expansion bolt, and a third section of said expansion bolt formed adjacent the second end of said bolt, said third section including a knurled surface fitting inside the collar as the collar swages outwardly to help hold the anchor in the hole and to help prevent rotation of said anchor in the hole.

3,855,897

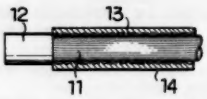
METHOD OF PROTECTING A BUNDLE OF FLEXIBLE OPTICAL FIBERS

Nagashige Takahashi, No. 80, Nishimachi Kokubunjishi, and Teruo Oouchi, No. 2-1-11, Kotobukicho, Fuchu-shi, both of Tokyo, Japan

Division of Ser. No. 875,836, Nov. 12, 1969, Pat. No. 3,691,001. This application June 5, 1972, Ser. No. 259,484

Int. Cl. B29d *11/00;* **G02b** *5/16*

U.S. Cl. 87—1 **5 Claims**



1. A method of protecting an elongated bundle of flexible optical fibers which comprises:

a. loosely enveloping said bundle with a tubular braid of intertwined filaments, the braid having an axis and the enveloped bundle being elongated in the direction of said axis;

b. axially stretching said braid until it contracts transversely to said axis and exerts radial pressure on said bundle;

c. impregnating the contracted braid with a liquid synthetic resin composition; and

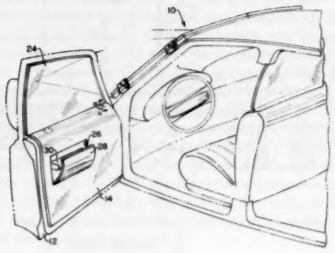
d. solidifying said composition while maintaining said braid in the contracted condition.

3,855,898

PROTECTIVE PANEL FOR A VEHICLE DOOR

Wilson C. McDonald, Phoenix, Ariz., assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Dec. 12, 1972, Ser. No. 314,295
Int. Cl. F41h 5/00
U.S. Cl. 89—36 H 1 Claim



1. A protective panel for a vehicle comprising a tough bullet resisting transparent plastic sheet, means for removably securing said panel to a vehicle, said sheet contoured to the inside contour of the lower portion of a door and having an upper edge curved towards the window at the upper portion of the door, metal plate attaching means secured to and extending up from such curved upper edge for securing the protective panel to the door, said sheet having an opening therein in which an armrest on the door is received, the sheet having an upwardly and inwardly curved panel section extending over the inner surface of the major portion of said armrest at said opening.

3,855,899

LOADING DEVICE FOR A MULTIBARREL WEAPON

Henri Billottet; Patrice Fechner; Robert Denoux, and Jean Georgel, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Mar. 27, 1972, Ser. No. 238,368
Claims priority, application France, Apr. 6, 1971, 71.12143
Int. Cl. F41f 17/16
U.S. Cl. 89—47 15 Claims

1. A loading device for a multibarrel weapon provided with a barrel-supporting block, comprising:

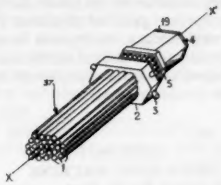
a magazine having a front face adapted to be juxtaposed with a rear surface of said block;

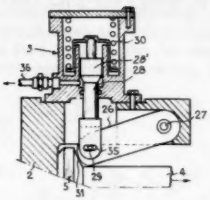
holding means in said magazine for a multiplicity of projectiles alignable with respective barrels of said weapon upon operative juxtaposition of said front and rear surfaces, said block and said magazine being provided with coacting guide means for positively aligning said magazine with said block in a spaced-apart position of said front and rear surfaces;

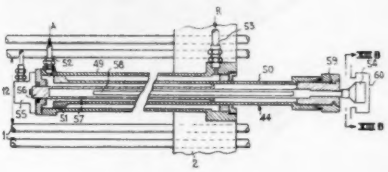
drive means on said block engageable with said magazine in said spaced-apart position for drawing said magazine into operative juxtaposition with said block;

coacting latch means on said block and said magazine for locking same to each other; and

firing means for said projectiles in said magazine, said magazine and said block being provided with channels parallel to said barrels and aligned with each other upon interengagement of said coacting guide means, said drive means comprising at least one draw bar lodged in a channel of







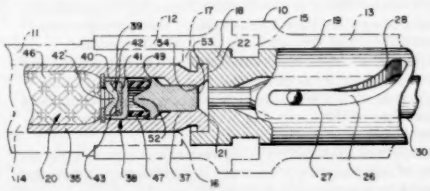
said block and extensible into an aligned channel of said magazine for engagement with the latter.

3,855,900

SYSTEM FOR PRIMER ACTUATION OF BOLT

Irwin R. Barr, Lutherville, and Nicholas J. La Costa, Kingsville, both of Md., assignors to Aircraft Armaments, Inc., Cockeysville, Md.

Filed Jan. 7, 1959, Ser. No. 785,525
Int. Cl. F41d 5/04; F42b 5/02
U.S. Cl. 89—159 11 Claims



1. For use with a gun having a firing pin, a cartridge having a hollow casing adapted to contain a powder charge and having a base at the rear end, said base having an axially extending aperture, a primer mounted in the forward portion of said aperture, retaining means for limiting movement of said primer in a forward direction, a piston slideably mounted in the rearward portion of said aperture behind said primer, said piston having a surface facing said primer, a forwardly

extending projection on said surface, said piston adapted to be driven forward by said firing pin causing said projection to strike said primer and deform the same against the resistance of said retaining means, the impact of said projection upon said primer causing initiation of the latter and ignition of the charge whereby propellent gases are produced which act upon said primer and said surface, said piston being rearwardly accelerated independently of said primer by the action of the propellent gases upon said surface to thereby impart a rearward acceleration to said firing pin.

3,855,901

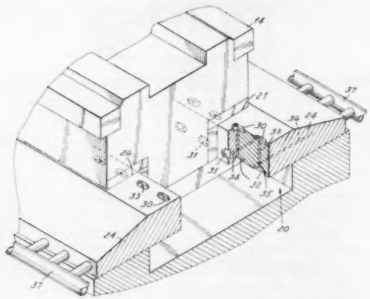
BROACHING MACHINE

Vincent J. Girardi, Grosse Pointe, Mich., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Oct. 15, 1973, Ser. No. 406,489

Int. Cl. B23d *37/18*; **F16c** *29/02*

U.S. Cl. 90—78 **9 Claims**



1. In a broaching machine, the combination comprising

a base,

an endless broaching chain mounted on said base,

a plurality of carriers mounted at longitudinally spaced points on said chain for supporting one of a workpiece and a broaching tool,

a mounting fixture positioned along a portion of the path of the carriers for supporting the other of a workpiece and broaching tool,

means defining a slideway along the path of the carriers adjacent the fixture, said slideway having a plurality of planar surfaces for supporting and guiding said carriers, said carriers having complementary surfaces to said slideway planar surfaces,

each of said slideway planar surfaces having longitudinally spaced cavities therein and capillary fluid passages associated therewith for supplying fluid to said cavities,

the length and diameter of the capillary fluid passages and the size of the cavities being such that when a cavity is uncovered due to the absence of a carrier thereover, fluid can flow to the cavity freely and be at atmospheric pressure in the cavity,

the length of each carrier being such that it covers a plurality of longitudinally spaced cavities as it is moved past the work station along said slideway,

the length of the slideway being such that a plurality of cavities are uncovered at any moment of time during which a carrier is moved along said slideway,

and means for supplying fluid to said cavities at least when a carrier is on said slideway such that each carrier is supported in stable, accurate frictionless relation to the slideway by fluid flow from said cavities between the complementary surfaces of said slideway and carrier.

3,855,902

CYLINDER PISTON UNIT FOR A POWER OPERATED REVOLVING CHUCK

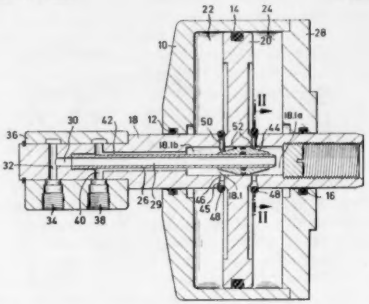
Rudi Kirst, Hilden, Germany, assignor to Hofmann & Co. KG, Haan, Germany

Filed Mar. 1, 1973, Ser. No. 337,126

Claims priority, application Germany, Nov. 21, 1972, 2256933

Int. Cl. F15b *11/08, 13/04*

U.S. Cl. 91—420 **7 Claims**



3. A revolving pressurized fluid actuated operator for a chuck, comprising:

a cylinder to confine pressurized fluid,

a piston in the cylinder and dividing the cylinder into a pair of fluid chambers, and the piston having a rod movable with the piston and relative to the cylinder to operate the chuck,

the piston rod being hollow,

fluid supply means including radial bores in the piston rod to direct pressurized fluid to the chambers and to vent the chambers alternately for controlling the piston movement in the cylinder and including check valves for each cylinder chamber to be opened and closed responsive to pressure reversal in the fluid supply means, said check valves comprising a pair of deformable rings respectively disposed at opposite sides of the piston and on the piston rod and in obstructing relation with said radial bores, said fluid supply means including a sleeve in the hollow piston rod and defining and separating fluid channels from each other,

an actuation member movably mounted in one of said bores to lift the check valve ring and provide venting of the respective cylinder chamber, and

an auxiliary piston being slidably mounted on said sleeve and being provided with cam faces engaging said actuating member for radially moving the actuating member in the bore.

6. A revolving pressurized fluid actuated operator for a chuck, comprising:

a cylinder to confine a pressurized fluid;

a piston in the cylinder and dividing the cylinder into a pair of fluid chambers, and the piston having a piston rod movable with the piston and relative to the cylinder to operate the chuck, the piston rod having a longitudinally extending hollow interior adjacent the piston defining a combined fluid passage and guideway, said piston rod also having a plurality of radial bores extending between said hollow interior and the exterior of the piston rod, said bores being disposed in at least two locations along the length of the piston rod adjacent each of said chambers so that certain of said bores provide communication between the hollow interior and one of the chambers, and the remaining bores provide communication between the hollow interior and the other of the chambers;

releasable valve means at the exterior of said piston rod and obstructing said radial bores, and including a plurality of plungers extending inwardly through said bores and pro-

truding into said hollow interior, said valve means being biased into bore-obstructing position and being operable in response to outward movement of said plungers to open the valve means and release pressure from the chamber;

a fluid pressure operated slider in said hollow interior of the piston rod which defines the slideway for the slider, said slider traversing the hollow interior and sealing around the interior periphery of the slideway to obstruct fluid communication longitudinally along the hollow interior of the piston rod, said slider having oblique camming surfaces bearing outwardly against said plungers to restrain inward movement of the plungers and produce radial outward movement of the plungers as the slider moves longitudinally along the piston rod for operating said valve means, said slider being moved along the interior of the piston rod by fluid pressure differentials between opposite ends of the hollow interior; and

said piston rod having a pair of separate fluid passages each communicating with a respective end of the hollow interior of said piston rod to facilitate control of the fluid pressure applied to said bores and to the corresponding sides of the slider for simultaneously pressurizing one of the cylinder chambers and venting the other chamber as the fluid pressure moves the slider to operate the plungers and valve means.

3,855,903

ENGINES, PUMPS AND MOTORS

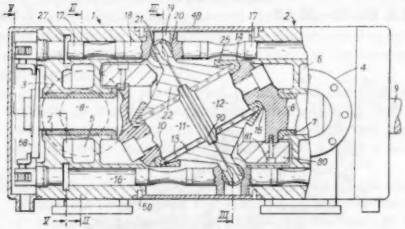
Thomas Walter Bunyan, 5, Point Close, Blackheath, London S.E. 10, England

Filed Jan. 24, 1973, Ser. No. 326,525

Claims priority, application Great Britain, Jan. 25, 1972, 3454/72

Int. Cl. F01b *3/10*

U.S. Cl. 91—480 **11 Claims**



1. In a fluid pump or motor or internal combustion engine of the kind comprising a crank shaft having an inclined working portion, first and second banks of cylinders at opposite ends of the crank shaft working portion, the cylinders in each bank being arranged around the crank shaft axis and facing the corresponding cylinders of the other bank with their axes parallel to the crank shaft axis, a set of piston rods each interconnecting a first piston in a cylinder of the first bank with a second piston in the corresponding cylinder of the second bank and a driving connection for each piston rod, the improvements which comprise:

a first fluid connection,

a first manifold chamber positionally associated with the first cylinder bank and serving both cylinder banks, said first fluid connection opening into said first manifold chamber,

a second fluid connection,

a second manifold chamber positionally associated with the second fluid connection opening into said second manifold chamber,

first and second valve-controlled ports for each cylinder of each bank,

the first ports of the first cylinder bank opening into said first manifold chamber,

the second ports of the second cylinder bank opening into the second manifold chamber,

first and second duct means extending between said first and second cylinder banks,

said first duct means interconnecting the second valve ports of said first cylinder bank with said second manifold chamber, and

said second duct means interconnecting said first valve ports of said second cylinder bank with said first manifold chamber.

3,855,904

AUXILIARY POWER STEERING SYSTEM

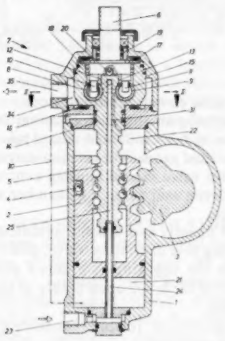
Erich Jablonsky, Bobingen/Rems, Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

Filed June 26, 1972, Ser. No. 266,053

Claims priority, application Germany, June 24, 1971, 2131276

Int. Cl. F15b *13/16, 9/10*

U.S. Cl. 91—359 **12 Claims**



1. In a booster power steering system utilizing a pressure storage reservoir as a pressure fluid source, the combination which comprises a double acting servo cylinder having a reciprocal piston therein and a servo cylinder pressure chamber at each end of said piston; manually operable valve means and flow passage means for connecting said storage reservoir to said chambers to selectively pressurize either of said chambers with operating pressure from said reservoir; said valve means having road reaction means for effecting simulated steering resistance; and force limiting means for overcoming said simulated steering resistance at a predetermined limit thereof responsive to operating pressure in said valve means; said valve means comprising a respective valve for each pressure chamber; said road reaction means comprising each said valve having a piston portion and a chamber and flow passage means whereby said chambers receive said operating pressure to act against the respective valve in a direction opposite to the opening direction thereof for effecting simulated steering resistance; said force limiting means comprising respective pressure operated pistons and flow passage means whereby said pistons are exposed to operating pressure controlled by each said valve; a respective prestressed spring against which each said pressure operable piston is movable in response to a predetermined pressure, and abutment means movable by an operator for opening either of said valves to pressurize a respective chamber and disposed to be actuated by either of said pressure operated pistons of said force limiting means in

a direction to aid valve opening upon said predetermined pressure acting on either of said pistons.

3,855,905

HYDRAULIC POWER CONTROL DEVICE

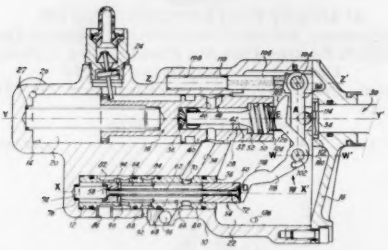
Jean-Jacques Carre, Montreuil, France, assignor to Societe Anonyme D.B.A.

Filed May 25, 1973, Ser. No. 364,400

Claims priority, application France, June 12, 1972, 72.021053

Int. Cl. F15b *9/10*

U.S. Cl. 91—384 **5 Claims**



1. In a hydraulic power control device:

a housing defining an actuating chamber therewithin;

a servo piston slidably mounted in said housing and responsive to the fluid pressure level in said actuating chamber; a distributor valve in said housing controlling communication between said actuating chamber and a fluid pressure source;

an input rod linearly and slidably mounted in said housing for actuating said distributor valve, said input rod including means for engaging said servo piston for manual movement of the latter upon failure of said fluid pressure source; and

a follower mechanism for interconnecting said distributor valve, said push rod, and said servo piston, said follower mechanism including a sensor having a pair of arms, one of said arms cooperating with said servo piston, the other arm cooperating with said distributor valve, a lever, means pivotally mounting one end of said lever on said housing, and means pivotally mounting the other end of the lever on said sensor, said input rod including abutment means for engagement with said lever.

3,855,906

CONTACT FREE AND DIRECTLY COOLED PISTON ARRANGEMENT

Alexander Mohrenstein-Ertel, and Michael Mohrenstein-Ertel, both of Hegelstrasse 81, 8600 Bamberg, Germany

Continuation of Ser. No. 240,574, April 3, 1972, abandoned. This application Mar. 15, 1974, Ser. No. 452,010

Claims priority, application Germany, Apr. 5, 1971, 2116624

Int. Cl. F01b *31/10*; **F16j** *15/18*

U.S. Cl. 92—153 **7 Claims**

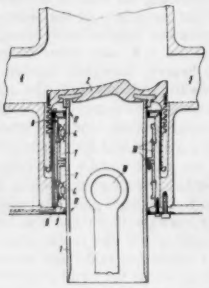
1. In a device having a cylindrical chamber having a cylindrical wall and inlet and outlet ports on opposite side of the chamber, a contact-free piston arrangement comprising:

a supporting wall mounted within the chamber at the lower portion of the chamber to form an annular recession between said supporting wall and the cylindrical wall of the chamber;

annular bushing means mounted on said supporting wall capable of being biased inwardly;

a cylindrical sleeve slidably supported and guided by said bushing means for movement between a first position and a second position within the chamber;

a piston head mounted on said sleeve, said piston head dimensioned to slide within the chamber without contacting the cylindrical wall of the chamber, said piston head



having an annular cylindrical side wall essentially parallel to said sleeve and adapted to extend into the annular recession between the cylindrical wall of the chamber and said supporting wall when said sleeve is in its first position, and said piston head having annular grooves formed in said side wall to form a labyrinth seal between said piston head and the cylindrical wall of the chamber.

3,855,907

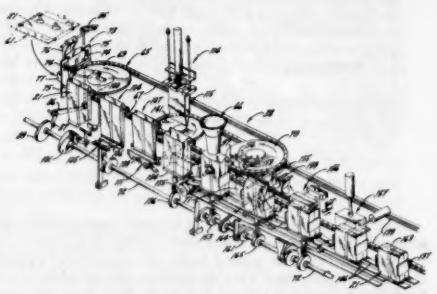
METHOD AND MACHINE FOR FORMING FLAT BOTTOM BAGS HAVING SIDE GUSSETS

Kenneth R. Johnson, and Robert F. Lense, both of Rockford, Ill., assignors to Rexham Corporation, New York, N.Y.

Filed May 18, 1973, Ser. No. 361,537

Int. Cl. B31b *33/74*

U.S. Cl. 93—35 SB **7 Claims**



1. A method of forming flat bottom, side gusset bags from a strip of interconnected bags, said strip having cross-seals connecting said bags together and having side gussets along opposite margins and each defined by two inwardly tucked panels which face one another, said method comprising the steps of, advancing said strip along a predetermined path, guiding the leading bag in said strip into a pick off station, separating the two panels of each of the gussets from each other as the bag is moved into said station, severing the leading bag from said strip adjacent said station along the edge of one of said cross-seals to leave the severed bag with one end closed by one of said cross-seals and with the other end unsealed, swinging said severed bag from said pick off station onto a conveyor, keeping each of the two panels separated

from each other as said bag is swung from said pick off station onto said conveyor, clamping said bag on said conveyor, maintaining each of said two panels separated from each other as said bag is clamped to said conveyor so as to permit subsequent expansion of said gussets to open said bag as the latter remains clamped to the conveyor, advancing said conveyor to carry said bag along a continuation of said path, folding a portion of the sealed end of the bag along one side of the bag while the bag is clamped to said conveyor, and sealing said portion against the side of the bag to complete formation of the sealed end of the bag prior to opening and filling of the bag.

3,855,908

DEVICE FOR THE MANUFACTURE OF PAPER CUPS

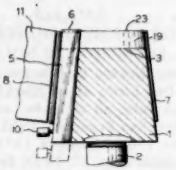
Werner Schmidt, and Fritz Wommelsdorf, both of Hamburg, Germany, assignors to Maschinenfabrik Rissen GmbH, Hamburg-Rissen, Surrheid, Germany

Filed June 5, 1973, Ser. No. 367,156

Claims priority, application Germany, June 6, 1972, 22274131

Int. Cl. B31b *1/28*

U.S. Cl. 93—36.5 R **5 Claims**



1. In a device for the manfacture of cups of paper or similar material, the cups consisting of a conic-shaped mantle and with a cup-shaped bottom portion inserted into the mantle with the side edges pointing toward the narrower end of the mantle and with the outer surface of the bottom portion being joined to the inner surface of the mantle, the improvement which comprises:

a. a conic-shaped pin adapted to receive a conic-shaped mantle in overlying relationship thereon, said mantle, when so received, partially extending beyond said pin at the narrower face thereof, said mantle having a seam portion extending along the length thereof:

b. a pressing cheek movably disposed adjacent said conic shaped pin and opposite said seam portion of said mantle;

c. means movably disposed to be moved adjacent the seam portion at the edge extending beyond said pin and within said mantle opposite said pressing cheek, whereby said seam portion is supported by an abutment surface, in relationship to said pressing cheek, along said pin and along said means.

3,855,909

MOUNTING ARRANGEMENT FOR AIR DIFFUSER IN A KERFED CEILING

Robert R. Lambert, Glendora, Calif., assignor to Air Factors, Inc., Redlands, Calif.

Filed Aug. 27, 1973, Ser. No. 391,793

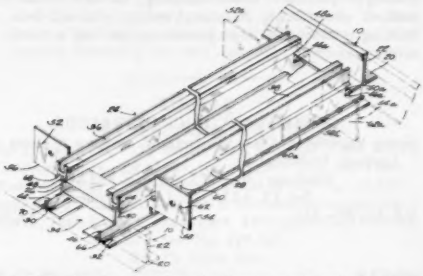
Int. Cl. F24f *13/06*

U.S. Cl. 98—40 D **11 Claims**

1. In a suspended ceiling including a plurality of main runner T-bars, a plurality of cross runner T-bars arranged at right angles to said main runners, each T-bar having a horizontal flange extending from opposite sides of a vertical leg, a plurality of ceiling tiles the edges of which are kerfed to provide horizontal notches, said ceiling tiles assembled in said ceiling with the flanges of said T-bars positioned in respective ones of said notches so that said ceiling has generally a monolithic appearance, and at least one linear air diffuser positioned between an adjacent pair of said T-bars and defining a generally linear air slot, the improvement of

the opposite ends of said air diffuser being coped to provide upwardly facing exposed surfaces,

said air diffuser arranged with said upwardly facing surfaces positioned beneath the flanges of the T-bars between which said air diffuser is positioned and said air slot being located at the plane of said ceiling,



a holding bracket positioned adjacent each end of said air diffuser and each bracket including a downwardly facing surface,

and means defining a sliding connection of said holding bracket on said air diffuser in which connection said holding bracket is slideable in a horizonal direction so that said holding brackets are slideable toward and away from a position wherein the downwardly facing surfaces of said holding brackets overlie the flanges of said T-bars between which said air diffuser is positioned to provide the support for said air diffuser in said ceiling.

3,855,910

ACOUSTICAL VENTILATOR

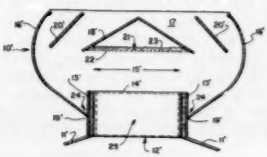
Bernard E. Brinton, Hitdorf, Germany, and Lugwig H. Schorn, deceased, late of Hitdorf, Germany (by Hedwig Schorn, administratrix), assignors to Robertson Bauelemente G.m.b.H., Monheim-Hitdorf (RHLD), Germany

Filed Sept. 11, 1972, Ser. No. 287,881

Claims priority, application Germany, Nov. 12, 1971, 2156189

Int. Cl. F24f *7/02*

U.S. Cl. 98—42 **4 Claims**



1. In a ridge ventilator which surmounts a generally rectangular and horizontal opening in the roof of a building, a generally vertical stack including generally vertical side stack walls and generally vertical end stack walls which are connected to each other and which form an open box-like enclosure partly above the said opening, said ventilator including side walls extended outwardly and upwardly from said stack generally parallel with the long edge of the opening and having end walls connected to the side walls and extending upwardly from the narrow edge of the opening, and having a cap member disposed above the opening between the side walls and extending substantially entirely between the end walls, the improvement comprising: an acoustic absorption assembly applied to the undersurface of the said cap member in confrontation with

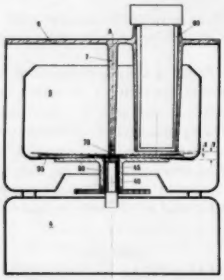
said opening, said assembly including a plurality of perforate rigid, sheets confronting said opening and a layer of absorbent for acoustical energy supported between the cap member and the sheets; and each of the end and side stack walls comprising an exterior sheet, an imperforate interior sheet, and an insulating material filling the space therebetween, thereby to minimize transmission of sound energy through the end and side stack walls, the imperforate inner sheet of the end and side stack walls providing imperforate inner surfaces having reflecting properties for acoustical energy, the imperforate inner surfaces channelizing acoustical energy received from the building interior into impingement against said acoustic absorption assembly.

3,855,911

CENTRIFUGAL JUICE EXTRACTOR

Georg Feierabend, Olten, Switzerland, assignor to Rotel AG, Aarburg, Switzerland

Filed Apr. 30, 1973, Ser. No. 355,804
Int. Cl. A23n *1/02*; A47j *19/00*
U.S. Cl. 99—511 **3 Claims**



1. A centrifugal juice extractor comprising a casing having a removable cover, a perforated basket removably and replaceably mounted within the casing so that the basket can be rotated about an axis of the basket, said basket having a light weight socket on the underside thereof, drive means for rotating the basket about such axis, said drive means including a drive shaft extending into said socket and being of a lesser size than said socket so as to fit loosely therein, a rubber elastic composition means in said socket so that said basket is mounted so that while it is being driven it can tilt relative to its axis of rotation under asymmetrically distributed loads, a grating disc at the bottom of such basket and a feed tube via which material can be fed into the casing into contact with the grating disc at a position offset from its rotation axis, a finger depending from said cover for bearing against a central zone of the bottom of the basket so as to prevent said basket and said grating disc from lifting during rotation thereof.

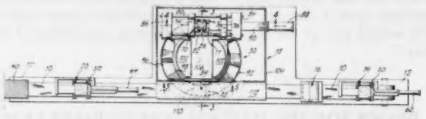
3,855,912

SANDWICH MAKING APPARATUS

Charles Donald Schoonmaker, Boonton Twsp.; Carl G. Hebel, Haworth, and Robert Francis Bardsley, Harrington Park, all of N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 12, 1972, Ser. No. 314,293
Int. Cl. A21c *9/04*; B26d *4/00*
U.S. Cl. 99—450.4 **6 Claims**

1. In a sandwich-making assembly system, apparatus for slicing a prismatic bar of thermoplastic comestible which comprises means for tempering a prismatic bar to a predetermined temperature ranging from below 0°F to 20°F and above that temperature whereat the bar may be sliced without shattering but below that temperature at which the bar will soften or curl incident to slicing; means for transversely slicing said bar across its cross-section; means for receiving the slice thus formed and transferring it to a depositing station operative to move the slice transverse to the bar's axis; means for positioning the transferred bar slice to a station from which it may be dropped onto a bread slice; means to advance the



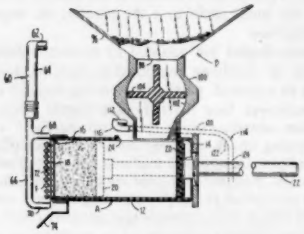
bread slice and superposed sealing slice to a succeeding operating station; and, means controlling the atmospheric temperature and moisture in the zone surrounding the foregoing bar slicing, transferring and depositing means so as to maintain a low relative humidity in said zone and assure that the parts thereof are substantially frost free.

3,855,913

APPARATUS FOR FORMING SHAPED POTATO PIECES FROM POTATO DOUGH

James F. Harmon; Richard D. Johnston; John H. Lach; William H. Von Der Lieth, all of Blackfoot, and Thomas L. Murphy, Idaho Falls, all of Idaho, assignors to American Potato Company, San Francisco, Calif.

Division of Ser. No. 170,164, Aug. 9, 1971, Pat. No. 3,771,937.
This application Sept. 17, 1973, Ser. No. 398,041
Int. Cl. B01f *15/02*
U.S. Cl. 99—487 **3 Claims**



1. Apparatus for reconstituting a dry product into a dough by addition of water thereto comprising an impervious chamber having an upwardly opening inlet and a laterally opening outlet, means disposed vertically above said inlet for metering a preselected quantity of dry product into said chamber through said inlet, means defining a water nozzle for directing water into said chamber through said inlet, means disposed at a lower vertical level than said nozzle for heating a volume of water, means for conducting water from said heating means to said nozzle along a path that slopes continuously upward from said heating means to said nozzle, and means for displacing water from said heating means to said water conducting means, said water displacing means affording reverse flow therethrough at all times when said displacing means is deactivated to permit water in said conducting means to drain by gravity into said heating means when said displacing means is deactivated.

3,855,914

APPARATUS FOR PRODUCING MINERAL WATER

Atsushi Nishino; Hiroshi Kumano, and Yukihide Iura, all of Osaka, Japan, assignors to Matsushita Electric Industrial Company Limited, Osaka, Japan

Filed Oct. 17, 1972, Ser. No. 298,446
Claims priority, application Japan, Dec. 1, 1971, 46-97049
Int. Cl. A23l *1/00*
U.S. Cl. 99—275 4 Claims

1. An apparatus of producing mineral water, which comprises:
first means for supplying source water;
second means for supplying carbonic acid gas;
third means mixing said source water with said carbonic acid gas so as to carbonate the source water; and
fourth means for mixing the carbonated water with at least one kind of water-insoluble mineral compound containing a mineral component so that said source water changes to mineral water.

3,855,915

EGG BLOWING DEVICE

Harold R. Hoyt, and Marjorie L. Hoyt, both of 321 N. Treat Ave., Shawnee Mission, Kans. 85716

Filed Feb. 12, 1973, Ser. No. 331,973
Int. Cl. A47j *43/14*
U.S. Cl. 99—495 9 Claims

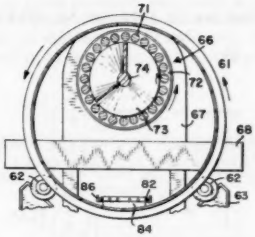
1. An egg blowing device comprising:
a. a hollow body member,
b. a soft, elastic sealing member forming one wall of said body member and having an aperture formed therethrough communicating with the interior of said body member and opening through an external surface of said sealing member, said sealing member being elastically yieldable both inwardly and outwardly relative to said body member and adapted to be pressed manually against an egg with the said aperture registered with an opening formed in the shell of said egg, and to engage the shell of said egg around the entire periphery of said shell opening, and
c. means carried by said body member and operable to introduce air under pressure into the interior of said body member, and, through said sealing member aperture and said egg shell opening, into the interior of said egg, whereby said sealing member is held against said egg is sealing relation about the opening in the shell thereof by said air pressure, despite relative movements between said egg and said body member, and whereby the contents of said egg are forced outwardly through another opening formed in the shell thereof.

3,855,916

DRY PEELING APPARATUS

Louis P. Lazzarini, 1125 Denise Way, San Jose, Calif. 95125

Continuation-in-part of Ser. No. 826,377, May 21, 1969, abandoned, and a continuation-in-part of Ser. No. 42,925, June 3, 1970, abandoned, and a continuation of Ser. No. 148,410, June 1, 1971, abandoned. This application Oct. 24, 1972, Ser. No. 299,760
Int. Cl. A23n *7/02*
U.S. Cl. 99—623 6 Claims



1. In an apparatus for peeling fruit and vegetables having peel removing means for removing the peel and debris, said means comprising a generally horizontal cyliner driven for rotation about its longitudinal axis as defined by a series of longitudinally extending peeling rolls which individually rotate about their respective longitudinal axes and throw peel and debris to the exterior of the cylinder, the improvement which comprises a generally horizontally extending housing disposed around and coextensive with said peel removing means to receive and collect on the interior pieces of peel and debris thrown from the rolls of the peel removing means, said housing being mounted for movement around said peel removing means; means driving said housing for movement around the peel removing means to move peel and debris collected on the interior of the housing to a discharge location; and means at the discharge location for removing the peel and debris from the interior of the housing.

3,855,917

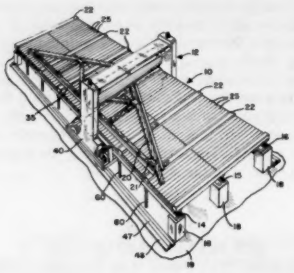
TRUSS PLATE PRESS

Richard S. Farrell, Fort Lauderdale, and Jose R. Ramos, Plantation, both of Fla., assignors to Dayton Aircraft Products, Inc., Fort Lauderdale, Fla.

Filed Oct. 15, 1973, Ser. No. 406,336
Int. Cl. B30b *13/00, 3/00*
U.S. Cl. 100—35 9 Claims

9. The method of applying pairs of connector plates into opposite sides of a truss joint comprising the steps of passing a roller over one plate of said pairs forcing the same into the truss and simultaneously with the movement of said roller sequentially bringing a series of bars into pressing engagement

with the opposite plate by moving said bars with a second and opposite roller, so that the distribution of pressing forces



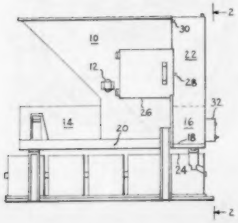
between said rollers is substantially confined at any one time to the width of one of said bars.

3,855,918

REFUSE COMPACTOR

Branko Trajbar, 9 Falcon Ct., Farmingville, Long Island, N.Y. 11738

Filed Jan. 22, 1973, Ser. No. 325,876
Int. Cl. B30b *15/6*
U.S. Cl. 100—49 **12 Claims**



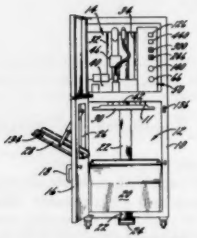
1. A compactor for waste materials comprising, in combination, collecting means for collecting a predetermined quantity of said waste material; sensing means on said collecting means for sensing when a predetermined quantity of waste material is present in said collecting means; compacting means actuated by said sensing means for compacting substantially said quantity of waste material; compacting control means connected to said compacting means and operating said compacting means until said quantity of waste material has been compacted by a predetermined amount; exit gate means in contact with the compacted material, said compacted material passing through said exit gate means for removal from said compactor; gate operating means linked to said gate means for removing said gate means from contact with said compacted material and forming a free passage for said compacted material from said compactor; ejection means movable against said compacted material and toward said exit gate means for ejecting said compacted material from said compactor through said free passage; compacted waste ejection control means for controlling said gate operating means and said ejection means; first connecting means between said ejection control means and said gate operating means; and second connecting means between said ejection control means and said ejection means, said second connecting means actuating said ejection means after said first connecting means has actuated said gate operating means, said first connecting means and said second connecting means being actuated simultaneously by said ejection control means, said gate operating means and said ejection means comprising hydraulically operated cylinders and pistons, said first connecting means and said second connecting means being fluid flow lines, the fluid flow line of said second connecting means having greater resistance to fluid flow than the fluid line of said first connecting means.

3,855,919

CONTROL SYSTEM FOR A COMPACTING MACHINE

Richard W. Potter, Downers Grove, Ill., assignor to McGraw Edison Company, Elgin, Ill.

Filed Aug. 21, 1972, Ser. No. 282,413
Int. Cl. B30b *15/16*
U.S. Cl. 100—52 **4 Claims**



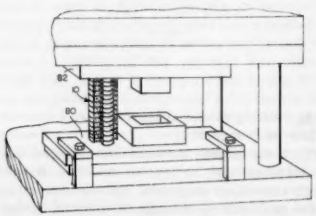
2. A control system for a compacting machine having a compaction chamber for receiving material to be compacted, a pressure plate spanning the area of said chamber for compressing the contents thereof, a reversible drive source for moving said pressure plate in the forward and reverse directions within said compaction chamber, and a panel at the top of the compaction chamber for enclosing said chamber, said control system including means for sensing the fully retracted position of said pressure plate to prevent further retraction thereof by rendering said drive source inoperative whenever the pressure plate reaches said fully retracted position, and said sensing means also being responsive to the position of the compaction chamber panel to render said drive source inoperative whenever material lodged between the pressure plate and the compaction chamber panel causes said panel to flex as the pressure plate retracts thereby preventing damage to said compaction chamber panel by the retracting pressure plate.

3,855,920

ADJUSTABLE SAFETY DIE BLOCK-RADIAL LOBE DESIGN

James T. Wright, Grosse Pointe Shores, Mich., assignor to Carlson-Dimond & Wright, Inc., Warren, Mich.

Filed Nov. 2, 1973, Ser. No. 412,102
Int. Cl. B30b *15/08*
U.S. Cl. 100—53 **28 Claims**



1. In an adjustable safety die block, the improved combination comprising

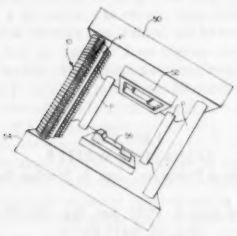
a plurality of segmental layers,
and means securing said segmental layers axially thereof in a parallel series forming a vertical stack,
at least some of said segmental layers being rotatable about said securing means for offset relationship to next adjacent segmental layers,
said next adjacent segmental layers being axially aligned and in contiguous load bearing relationship,
said offset segmental layers being axially aligned and in non-load bearing relationship.

3,855,921

ADJUSTABLE U-SHAPE SAFETY DIE BLOCK

James T. Wright, Grosse Point Shores, Mich., assignor to Carlson-Dimond & Wright, Inc., Warren, Mich.

Filed Nov. 2, 1973, Ser. No. 412,150
Int. Cl. B30b *15/08*
U.S. Cl. 100—53 **27 Claims**



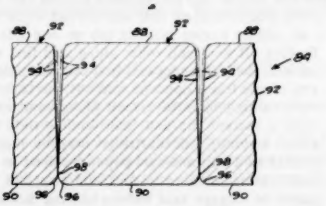
1. In an adjustable safety die block of substantially U-shape design for use on an inclined press post, the improved combination comprising
a plurality of segmental layers of substantially U-shape design and means securing said segmental layers through a portion thereof in a parallel series forming a vertical stack,
at least some of said segmental layers being rotatable about said securing means for offset relationship to next adjacent segmental layers,
said next adjacent segmental layers being aligned one upon the other in contiguous load-bearing relationship,
said offset segmental layers being disposed upon said next adjacent segmental layers in non-load bearing relationship.

3,855,922

COMBINATION OF APPARATUS AND BUFFER STRUCTURE

Frank Krembel, Jr., St. Clair Shores, Mich., assignor to Columbia Marking Tools, Inc., Detroit, Mich.

Filed Jan. 29, 1973, Ser. No. 327,446
Int. Cl. B44b *5/02*; **B21f** *35/00*
U.S. Cl. 101—3 R **13 Claims**



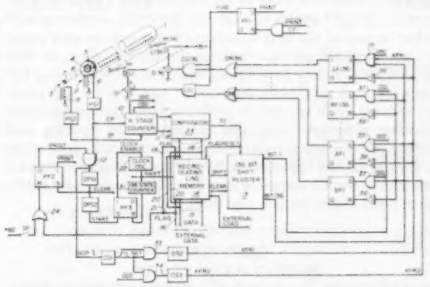
1. Apparatus which comprises,
two members assembled for relative movement wherein respective portions thereof approach each other,
a buffer comprising means defining a series of elements disposed between said portions,
each of said elements having an edge and ends adjoining said edge and forming junctures therewith,
said ends extending transversely of the direction of said movement and the junctures between said ends and edge being spaced apart in said direction,
said ends of successive elements in said series being arranged in juxtaposed pairs, said ends of each juxtaposed pair having portions proximal to said junctures which are relatively close together,
said ends of each juxtaposed pair having portions distal of said junctures which are spaced relatively further apart in said direction than are said proximal portions,
said proximal portions of said ends being generally aligned in said direction,
each of said elements having portions which extend continuously in said direction between said proximal portions thereof,
said members, responsive to said relative movement thereof, being effective to exert force on the end ones of said elements in said series,
said pairs of aligned proximal portions being interengaged when said force is so exerted,
said continuously extending portions cooperating to form a solid column in said direction when said proximal portions are so interengaged,
said elements being resiliently distortable so that, responsive to an increase of said force upon further said relative movement of said members, the spacing between said distal portions of said juxtaposed pairs of ends is diminished.

3,855,923

PRINT CONTROL SYSTEM FOR HIGH SPEED PRINTERS

John J. Foley, 1 Alquonquin Rd., West Acton, Mass. 01720

Filed June 29, 1973, Ser. No. 375,135
Int. Cl. B41j *9/12*
U.S. Cl. 101—93.29 **12 Claims**



1. In combination with a high speed printer having a character pulse generator for producing character pulses at first intervals determined by the intervals between arrival of a series of characters in printing position, memory means for storing a sequence of character signals representing the characters in a line to be printed, means responsive to each character pulse for scanning said memory means and producing a sequence of binary signals each determining whether or not a character is to be printed in a different column following that character pulse, means for sequentially registering said sequences, timing signal generating means responsive to said character pulses for alternately producing a first or a second timing pulse following each memory scan, an image forming device for each binary signal in said sequence, and means controlled by said registering means and said timing signal generating means for energizing each of said image forming devices for a time determined by said timing pulses when said

registering means is storing a binary signal indicating that a character is to be printed by that image forming device and one of said timing signals is present.

3,855,924

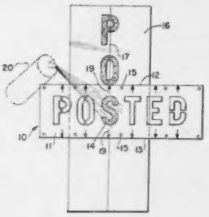
SIGN MAKING STENCIL METHOD

William E. Morse, Jr., 612A Bankers Trust Plaza Bldg., Jackson, Miss. 39201

Continuation-in-part of Ser. No. 292,752, Sept. 27, 1972, abandoned. This application Oct. 1, 1973, Ser. No. 402,603

Int. Cl. B41m *1/12*; **G09b** *11/04*

U.S. Cl. 101—129 **2 Claims**



1. A method of making signs using a sign stencil which comprises an elongated rectangular panel having parallel longitudinal edges, said panel being provided with a longitudinally extending row of cut-outs defining a set of indicia, said row of indicia having a predetermined spacing from said longitudinal edges of the panel, and transversely aligned marker means provided at said longitudinal edges centrally of the respective indicia, whereby the stencil may be selectively used in one position to make an entire sign in one direction or may be shifted indicia-by-indicia in sequence from one end of the stencil to the other to make the same sign in a direction at right angles to the first mentioned direction, said method comprising using one edge of the sign to form a guide line on a surface at right angles to said one direction, centering said marker means of the first indicium of said row on said guide line, painting said surface through the first indicium of said row, and successively moving the stencil to center the marker means for each successive indicium of said row on said guide line, spacing each successive indicium from the immediately preceding indicium using said predetermined spacing and painting said surface through each indicium in sequence while the marker means opposite each indicium is centered on said guide line to form a complete sign corresponding to said entire sign at right angles to said one direction.

3,855,925

POCKET HAND STAMP

Takaji Funahashi, No. 1, 2-chome, Kitatakasho-mashi, Nishi-ku, Nagoya-shi, Aichi-ken, Japan

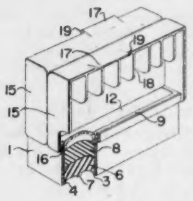
Filed Apr. 27, 1973, Ser. No. 355,302

Claims priority, application Japan, June 26, 1972, 47-75323[U]

Int. Cl. B41k *1/50, 1/52, 156*

U.S. Cl. 101—333 **3 Claims**

1. A pocket hand stamp comprising, in combination, a box-shaped holder having an open top and an open bottom; said top having a pair of first recesses at the outside of each end; said bottom having a flange on the inner side thereof; a cover plate detachably mounted on said top and having a pair of second recesses at the outer side of each end, said first recesses being respectively combined with said second recesses to form bearing holes; a printing plate provided between said cover plate and said flange and supported on the latter, said plate being made of an elastic sponge material having numerous fine continuous foam portions for receiving ink; a pair of box-shaped covers of the same size, having pivots on the inner sides of both ends to engage said bearing holes respectively, and snap members on the outer sides of said covers; said snap members having inner edges which are engageable with each other; said covers having inner ribs in the inside thereof for reinforcement and non-slippage when being



held by the user, and serving to cover said plate and being interengaged, when said covers are turned to a first position under said bottom of the holder, and provide a handle for the stamp, and placed upright back to back, so that said ribs are turned outwardly when said covers are turned to a second position over said top of the holder.

3,855,926

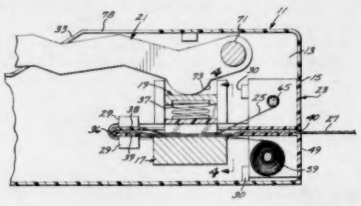
SIGNATURE WRITER

Joseph K. Dikoff, 4 Privateer, Apt. 3, Marina Del Rey, Calif. 90291

Filed Aug. 6, 1973, Ser. No. 386,191

Int. Cl. B41f *31/16*

U.S. Cl. 101—336 **7 Claims**



1. A ribbon cartridge for receipt in a printer having a cartridge-receiving chamber including a print support surface having a print bar spaced from said support surface to form therebetween a ribbon path and having a raised indiciabearing face shiftable toward said surface, said cartridge comprising:

a cartridge frame formed with first and second coextensive webs projecting along said path and spaced apart to form therebetween a paper-receiving slot, said web being formed with confronting windows of sufficient size for passage therethrough of said indicia-bearing face;

feed and take-up rollers mounted on one end of said frame from said respective first and second webs; and

an ink ribbon having printing ink on one side thereof and feeding off said feed roller along said first web with the ink side thereof facing said first web and extending to the end of said frame opposite said one end to form a first run then turning back to extend along said second web to form a second run and then feeding onto said take-up roller whereby said cartridge may be inserted in said printer as a unit and said paper received in said slot and said printer actuated to shift said print bar towards said paper to engage said indicia-bearing surface with said second run of said ribbon and urge it through said second window to engage said paper and urge it into contact with said first run of said ribbon and then press said second run, paper and first run together and against said support

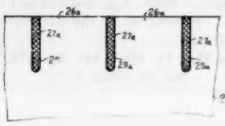
surface to print said indicia on the front and back sides of said paper.

3,855,927

INK FOUNTAIN BLADE FOR PRINTING PRESSES

Claus Simeth, Offenbach, Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Offenbach/Main, Germany

Filed June 12, 1973, Ser. No. 369,154
Claims priority, application Germany, June 13, 1972, 2228625
Int. Cl. B41f 31/04, 9/10
U.S. Cl. 101—350 5 Claims



1. As an article of manufacture, a composite ink fountain blade for cooperation with a form roller of a printing press to control the thickness of ink film in each of a plurality of zones along the length of the blade comprising, in combination, a continuous blade member formed of hard stiff metal in relatively thick section, such blade member having a set of parallel slots formed in the edge thereof and dividing the edge of the blade into adjacent sections corresponding to said zones, a thin continuous cover plate superimposed upon the blade member and having a fraction of the thickness of the blade member, the cover plate projecting slightly beyond the edge of the blade member for engagement with the fountain roller, the cover plate being bonded to the blade member and the slots being fully occupied by an elastic rubber-like material bonded to the edges of the slots and bonded to the cover plate to form a composite blade having smoothly continuous external surfaces free of recesses in which dried ink might collect while permitting movement of each section of the blade member substantially independently of the adjacent sections accompanied by movement and flexing of the thin cover plate, and means including an independently adjustable cam for engaging the underside of each of said blade sections for transmitting adjusting motions from the cam to the cover plate.

3,855,928

METHOD AND APPARATUS FOR PRINTING

Layton C. Kinney, Chicago, and Edwin H. Tompkins, Riverside, both of Ill., assignors to American Screen Process Equipment Company, Chicago, Ill.

Filed Feb. 27, 1970, Ser. No. 15,153
Int. Cl. B41m 5/00
U.S. Cl. 101—471 9 Claims

1. A method of printing intelligence on a surface of a printing medium comprising steps of:

forming a layer comprising a volatilizable colorant and an absorber of radiant energy,

positioning said layer between the surface to be printed and a sheet of material having an area transparent to radiant energy and corresponding to the intelligence to be printed, and

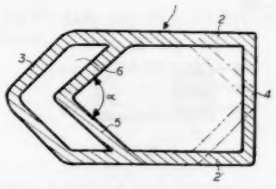
subjecting said sheet of material and the portion of said layer adjacent said transparent area to a pulse of radiant energy sufficient to cause said colorant in said area to volatilize under the influence of the radiant energy absorbed by said absorber of radiant energy and to condense on said surface to be printed.

3,855,929

LINEAR SHAPED CHARGE DEVICE

John J. Ridgeway, 403 20th St., Apt. No. 41, Gretna, La. Assignee: Explo-Ridgeway International Limited, St. Helier, Jersey, Channel Islands

Filed Feb. 7, 1972, Ser. No. 224,206
Int. Cl. F42b 3/08
U.S. Cl. 102—24 HC 7 Claims



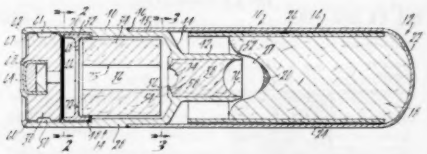
1. An improved linear shaped charge device comprising a hollow chevron-shaped explosive chamber and integrally formed therewith an air tight, hollow stand-off chamber located adjacent to and below said chevron-shaped explosive chamber, the bottom, interior wall of said explosive chamber being an explosive liner wall, and both hollow chambers being constructed from extrudable metal as a one-piece extrusion.

3,855,930

PERSONNEL DISTRESS SIGNAL

Stephen F. Mulich, San Ramon; Donald R. Duffy, Dublin, and Steven J. Salter, Walnut Creek, all of Calif., assignors to MB Associates, San Ramon, Calif.

Filed Sept. 2, 1970, Ser. No. 68,953
Int. Cl. F42b 13/40
U.S. Cl. 102—34.4 25 Claims



1. In a rocket device,

an elongated generally tubular shaped housing, a cylindrically shaped propulsion charge in one end of said housing,

first means for directing the products of combustion of said charge rearwardly of said housing in a manner so as to impart rotary motion to said device as it is propelled forwardly by said charge,

signal means in said housing,

second means including a combustible material for igniting said signal means at a predetermined time after said propulsion charge has been ignited, and

spacing means located between said first means and said charge for operatively supporting said propulsion charge, said spacing means including an annular shaped transversely extending web section and an axially extending flange located about the outer periphery of said web section and defining symetrical portions on opposite axial ends of said web section, said symetrical portions defining identically formed first and second recess means located on opposite axially spaced ends of said spacing means, one of said recess means cooperatively receiving and radially securing one end of said charge while the oppo-

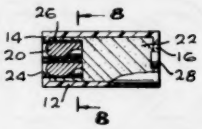
site symetrical portion selectively locates said charge in preselected axially spaced relationship relative to said first means.

3,855,931

SALVO AMMUNITION FOR MULTIPLE BORE OPEN CHAMBER GUN

David Dardick, Palos Verdes Peninsula, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Division of Ser. No. 665,139, Sept. 1, 1967, Pat. No. 3,501,998. This application Dec. 30, 1968, Ser. No. 787,754
Int. Cl. F42b 5/02, 9/06
U.S. Cl. 102—38 5 Claims



1. Salvo-type ammunition to be fired in a multiple bore open chamber gun of the character described, comprising:

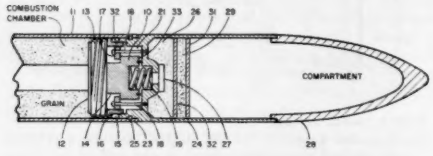
an ammunition round of generally triangular round shape in transverse cross-section having a central longitudinal axis and containing a rear propellant charge and a plurality of forward positionally fixed mutually axially coextensive elongate projectiles having individual longitudinal axes substantially parallel to and uniformly spaced from said central axis of said round, and said projectiles being angularly spaced in a predetermined array about said central axis.

3,855,932

EXPELLING CHARGE IGNITION SYSTEM

Leland L. Parker, Corona; Jerry O. Jones, Ventura, and Michael R. Osburn, Ridgecrest, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 23, 1973, Ser. No. 408,784
Int. Cl. F42b 15/10
U.S. Cl. 102—49.5 2 Claims



1. A rocket carrying a payload for ejectment at a predetermined point along its trajectory comprising:

a combustion chamber containing rocket propulsion fuel for propelling said rocket along a fixed path;

a compartment attached to said chamber having one end nearest said combustion chamber filled with an explosive charge for supplying a rapid expanding force;

shock reducing material positioned adjacent and in contact with said explosive charge for completely enclosing said explosive charge within an end portion of said chamber;

communicating passageway concentric with said compartment and said combustion chamber;

a circular plug member having a reduced diameter portion at one end to form a shoulder and a cavity at its other end, said plug member positioned between said chamber and said compartment and operable to open and close said communication passageway;

a spring housed partially within the cavity in said circular plug and compressed in its closed position; and

heat sensitive restraining collar fixably secured to said compartment and said plug at its reduced diameter portion for holding said plug member in a position to close said passageway;

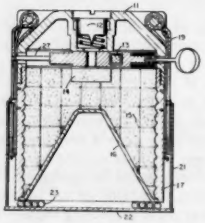
whereby the completed burning of the propulsion fuel in the combustion chamber causes hot gases to impinge upon the restraining collar allowing the passage of hot gases through the passageway to ignite the expelling charge to forcibly eject the payload from the compartment after the spring pressure overcomes the combustion chamber pressure.

3,855,933

DUAL PURPOSE GRENADE

Joseph R. Messineo, Clifton, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 11, 1967, Ser. No. 638,705
Int. Cl. F42b 13/50
U.S. Cl. 102—56 4 Claims



1. A dual purpose grenade which comprises;

a base,

a hollow cylindrical sleeve of open end construction secured in axial alignment to said base,

a spring means mounted in said sleeve against said base,

a canister having a lower and upper end,

said lower end of said canister insertably mounted into said sleeve against said spring,

said canister containing, in series, a firing pin, a detonator, a booster, and a shaped high explosive charge, and

a plurality of spring actuated vanes, each of which having an upper and lower end,

said upper end of said vanes being pivotally mounted on said upper end of said canister,

said lower ends of said vanes being restrained in position adjacent to the body of canister by said cylindrical sleeve.

3,855,934

BLIND MATING CONNECTOR FOR MISSILE SECTIONS

Rudolph E. Nett, Los Angeles, Calif., assignor to The United States of America as represented by the Secretary of the Army, D.C.

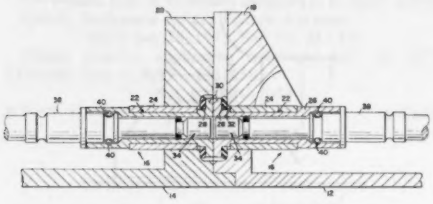
Filed Sept. 28, 1972, Ser. No. 293,178
Int. Cl. F42b 3/10
U.S. Cl. 102—70 R 1 Claim

1. Apparatus for transmitting detonation waves between missile sections comprising:

a. a flanged portion provided on the distal ends of said missile sections and each of said missile sections having a recess therein;

b. sleeve assembly means carried in predetermined positions on said flanged portions, whereby upon assembly of said missile sections, said sleeve assembly means in each of said missile sections will be in alignment, said sleeve assembly means consisting of a pair of connector assemblies, each of said connector assemblies including a first outer cylindrical member, a second cylindrical member

disposed within said first cylindrical member, said second cylindrical member including first and second end portions extending through the ends of said outer cylindrical member, said first end portion having a flange thereon, the flange of each said first end portion disposed in abutting relation responsive to assembly of said missle sections; and gasket means disposed between each said flange of said second cylindrical member and each said recess of said missile sections; and



c. explosive means carried in each said connector assembly for initiating said detonation waves, each said explosive means including a mild detonation fuse, an explosive communicating with said mild detonation fuse; and an end cap enclosing said explosive means, said end cap disposed in said inner cylinder adjacent said flanged end thereof, and said mild detonation fuse extending through said second end portion of said inner cylindrical member.

3,855,935

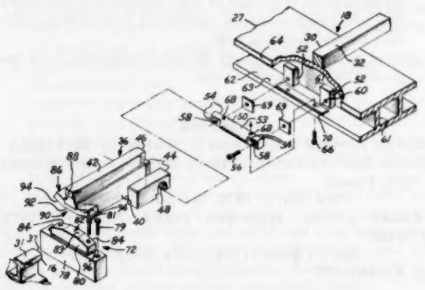
SELF ADJUSTING TRACK EXTENSION

Donald H. Busam, Hometown, Ill., assignor to Interlake Inc., Chicago, Ill.

Division of Ser. No. 213,981, Dec. 30, 1971, Pat. No. 3,732,992. This application Jan. 12, 1973, Ser. No. 323,266

Int. Cl. B60s *13/02*; **B61j** *1/10*

U.S. Cl. 104—48 **2 Claims**



1. A self adjusting member for supporting a first vehicle during transfer of said vehicle to and from a second vehicle, comprising:

an elongate member having an upward facing supporting surface thereon extending substantially the length of said member,

pivotal mounting means adjacent one end of said member for pivotally mounting said member about a pivot axis for vertical movement of said elongate member thereabout, and

cam means on said member spaced from said pivotal mounting means toward the other end of said member, said cam means defining a curved surface, said surface being positioned on said member such that a plane perpendicular to said surface is parallel to said pivot axis, said surface urging said member in said vertical movement about said pivot axis when said surface is moved in a direction parallel to said pivot axis and into contact with an abutting element.

3,855,936

MOTORIZED ROLLER-COASTER CAR

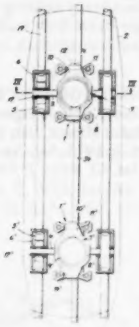
Anton Schwarzkopf, Munsterhausen/Schwaben, Germany, assignor to Firma Anton Schwarzkopf, Munsterhausen/Schwaben, Germany

Filed Mar. 29, 1972, Ser. No. 239,016

Claims priority, application Germany, Mar. 30, 1971, 2115394

Int. Cl. A63g *7/00*; **B61c** *9/52*, *11/00*

U.S. Cl. 104—63 **16 Claims**



1. A vehicle for a roller coaster provided with a pair of rails forming a guidetrack, comprising:

a vehicular body;

a front axle and a rear axle each provided with a pair of rail-engaging wheels;

an individual bearing plate for each axle provided with two outrigger arms pivotally connected thereto forwardly and rearwardly of the respective axle and generally paralleling same;

a pair of shock absorbers carried on opposite ends of each outrigger arm inwardly of said rail-engaging wheels for yieldably anchoring each bearing plate to said body to facilitate relative universal movement therebetween, each of said shock absorbers including a dashpot and resilient means in combination therewith; and

a swivel mounting linking each axle with the respective bearing plate for enabling each axle to rotate freely about a vertical axis with reference to said body.

3,855,937

ELECTRIFIED TROLLEY TRACK

Kent H. Caudill, E. 3618 Tenth Ave., Spokane, Wash. 99202

Filed Mar. 14, 1974, Ser. No. 451,038

Int. Cl. B61b *3/02*

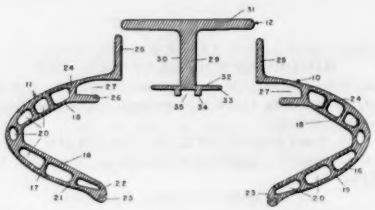
U.S. Cl. 104—94 **3 Claims**

1. A current carrying tram track unit for wheel supported trams comprising, in combination:

similar elongate opposed support elements having upper central flanges for joinder to a medial hanger beam and laterally extending portions defining an internal channel having a cross-section with lateral most parts defined as opposed outwardly pointing truncated triangles to accept and rollably support opposed truncated conical wheels of a tram truck;

a central hanger beam having a medial portion positioned between the upper medial flanges of the opposed support elements;

fastening means releasably joining the opposed support elements and central hanger beam; and



insulating means electrically isolating the support elements and central hanger beam from each other.

3,855,938

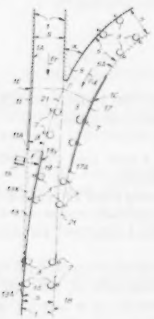
SWITCHES OR POINTS FOR TRACKS FOR VEHICLES

Cesare Peveraro, Milano, Italy, assignor to Societa' Per La Strada Guidata S.R.L., Milano, Italy

Filed Oct. 1, 1973, Ser. No. 402,390

Int. Cl. E01b *25/08*

U.S. Cl. 104—130 **3 Claims**



1. A switch for track for a vehicle having horizontal drive wheels for cooperation with opposing surfaces of the track to guide the vehicle and guide rollers for external surfaces on the track for allowing the vehicle to be driven on only one side, the switch adjacent a straight portion opposite a deviation having

a first guide with an inwardly-facing surface and an outwardly-facing surface, said guide being fixed near the crossing zone of the switch and

a movable resilient tongue fixed by one end remote from the switch zone and arranged to be deformed to provide a deviation; and

a second, fixed, guide with an inwardly-facing surface and an outwardly-facing surface, in correspondence and on the side opposite the crossing, the second guide extending parallel to one end portion of the resilient tongue when the tongue is deviated, the tongue and second guide cooperating to provide an overlap region for facilitating travel of a vehicle onto or off the deviated track, the vehicle being guided first on one side and then on the other.

3,855,939

MAGNETICALLY SUPPORTED SUSPENDED RAILWAY

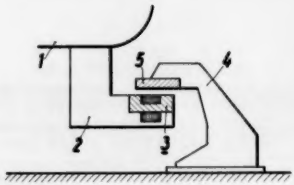
Werner Woitsch, Ottobrunn, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed Aug. 10, 1972, Ser. No. 279,733

Claims priority, application Germany, Aug. 14, 1971, 2140874

Int. Cl. B61b *13/08*

U.S. Cl. 104—148 MS **4 Claims**



1. An electromagnetic suspension system for vehicles, comprising:

electromagnetic means comprising two rows of electromagnets arranged side-by-side on opposite sides of said vehicle and extending in a horizontally aligned relation;

a pair of magnetically conductive rails on opposite sides of said vehicle, each of said electromagnets being opposed by one of said magnetically conductive rails, each of said magnetically conductive rails being narrower in width than the combined width of said rows of said electromagnets, said electromagnets being adapted to freely suspend said vehicle and to define a lateral guidance means for maintaining an equal spacing of said vehicle from said pair of said magnetically conductive rails, said electromagnets lie in pairs opposite one another on said both sides of said vehicle and being symmetrically arranged relative to the longitudinal axis of said vehicle, each of said electromagnets being magnetically asymmetrically arranged relative to each of said magnetically conductive rails when said vehicle is equidistant from said magnetically conductive rails; and

control means for energizing the electromagnets of one row greater than in the other row.

3,855,940

BOGIE LINEAR INDUCTOR SUSPENSION ASSEMBLY

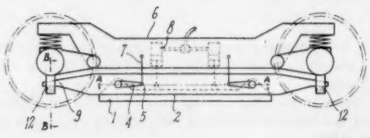
Georges Pinto, Le Creusot, France, assignor to Creusot-Loire, Paris, France

Filed Nov. 1, 1972, Ser. No. 302,679

Claims priority, application France, Nov. 12, 1971, 71.40485

Int. Cl. B61c *11/00, 15/04;* **B61h** *7/08*

U.S. Cl. 105—77 **4 Claims**



1. A suspension for a Foucault-current linear-inductor on a railway vehicle bogie having axle boxes and a frame comprising a Foucault-current linear inductor, means for the transmission of forces from said inductor to the bogie frame and means for displacing said inductor in a vertical plane passing through an adjacent rail between an upper inoperative position and a lower operative position, a beam supporting said inductor located in a vertical plane substantially passing through the

bogie axle boxes, arm means connected to said beam, link means connecting said arm means to the bogie frame and guide means in the axle boxes for centering and supporting said beam in the lower operative position of said inductor.

3,855,941

MONO-RAIL TROLLEY

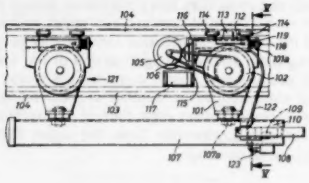
Hans-Georg Fromme, Wetzlar, and Erich Lehberger, Dornholzhausen, both of Germany, assignors to R. Stahl Aufzuge GmbH, Neuhausen auf den Fildern, Germany

Filed July 25, 1973, Ser. No. 382,471

Claims priority, application Germany, July 25, 1972, 2236509; June 22, 1973, 2331656

Int. Cl. E04h *3/04*

U.S. Cl. 105—150 **8 Claims**



1. A trolley for a substantially C-shaped mono-rail having current conducting bars in the upper portion of the rail, the trolley comprising

a. a motor,

b. a gear mechanism in driving connection with said motor,

c. a carrying wheel adapted to support the trolley on the running surface of the mono-rail, said carrying wheel being driven by said gear mechanism,

d. a shackle to which said motor, said gear mechanism and said carrying wheel are mounted for forming a subassembly which may be separately handled,

e. a carrier plate detachably mounted on the upper portion of said shackle, and

f. current conducting means for transmitting the current from the current conducting bars by way of plug-in connections to the motor and to further electric components, said current conducting means and said plug-in connections being part of said carrier plate;

the trolley being safely retained in said mono-rail when said carrier plate is mounted on said upper shackle portion and being easily removable from said mono-rail when said carrier plate is detached from said upper shackle portion and said plug-in connections are disconnected so that said shackle and said carrier plate may be handled as separate units.

3,855,942

SNUBBED RAILWAY TRUCK BOLSTER

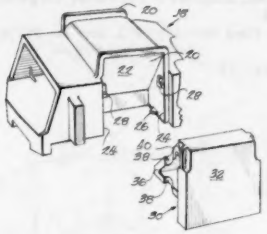
Harry W. Mulcahy, Lansing, Ill., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Sept. 28, 1973, Ser. No. 401,833

Int. Cl. B61f *5/12, 5/24, 5/50*

U.S. Cl. 105—197 DB **4 Claims**

1. In a railway car truck including a side frame having a window, a bolster having one end resiliently supported in said window, said bolster having a pocket adjacent said side frame, and a friction shoe receivable in said pocket for snubbing engagement with said side frame and said bolster, the improvement wherein said bolster and said friction shoe include cooperative means comprising a lug extending from said bolster into said pocket and an indentation in said friction shoe for receiving said lug, said lug and indentation being in alignment for insertion of said friction shoe into said pocket and



being offset thereafter whereby said lug retains said friction shoe in said pocket.

3,855,943

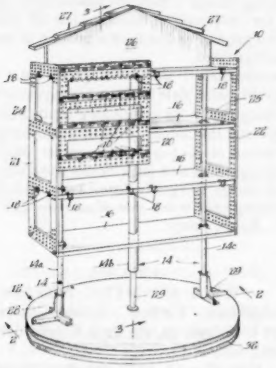
DISPLAY RACK CONSTRUCTION

Charles O. Larson, Sterling, Ill., assignor to Chas. O. Larson, Co., Sterling, Ill.

Filed Aug. 2, 1973, Ser. No. 385,033

Int. Cl. A47b *5/00, 57/100*

U.S. Cl. 108—28 **6 Claims**

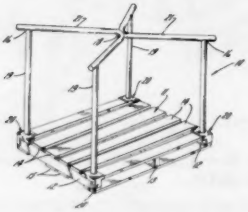


1. A display rack construction of the type to display a plurality of different kinds of articles, said display rack construction comprising in combination: a support base to be positioned over a floor area at which the display rack is to be located for displaying a plurality of different kinds of articles, standard means extending upwardly from said support base a predetermined height, shelf means extending transversely of and connected to said standard means, said shelf means including a plurality of apertures formed near the peripheral portions thereof, said apertures having the axes thereof extending vertically and being sized to receive article support bracket means, and article support bracket means having a depending portion insertable into said apertures formed in the periphery of said shelf means, said article support bracket means further including an extended portion extending outwardly of said shelf means, said extended portion and said depending portion being integrally connected by a bight portion which is carried at the top marginal edge surface of said shelf means, said extended portion extending from near the bottom edge of said shelf means.

3,855,944
PROTECTIVE BASE PLATES FOR PALLET TIERING FRAMES

Leroy F. Skubic, La Port, and Peter P. Blozis, Beverly Shores, both of Ind., assignors to The Paltier Corporation, Michigan City, Ind.

Filed Nov. 17, 1972, Ser. No. 307,424
Int. Cl. B65d *19/44*
U.S. Cl. 108—55 **8 Claims**



1. In a pallet tiering frame with upright posts for mounting on a pallet having parallel stringers and a plurality of spaced deck boards secured to said stringers transversely thereof, a base plate connected at the lower end of one of said frame posts for detachably securing said post to said pallet comprising, in combination,

a flat plate secured at the lower end of said post for positioning on one of said deck boards at a location where said deck board traverses an end of one of said stringers,

a depending flange extending downwardly from said flat plate for covering the interface line of said deck board and stringer end and at least a portion of the end face of said stringer end,

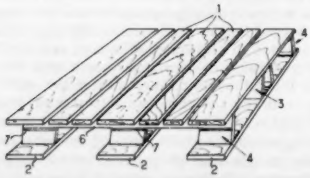
a first substantially L-shaped flange having a vertical plate and a horizontal plate both extending inwardly from said depending flange for positioning against the side of said stringer and the immediately adjacent underside of said deck board respectively to cover the interface between said stringer side and deck board underside, and

a second flange integrally formed on said base plate for positioning against the side of said stringer opposite said first L-shaped flange.

3,855,945
WOOD AND METAL PALLET

Roger V. Sebilleau, "Kerheol", Avessac (Loire Atlantique), and Kurt I. Eklund, 24, rue de la Guichardais, Redon (Ille et Vilaine), both of France

Filed May 12, 1972, Ser. No. 252,660
Claims priority, application France, May 12, 1971, 71.17079
Int. Cl. B65d *19/38*
U.S. Cl. 108—57 **2 Claims**

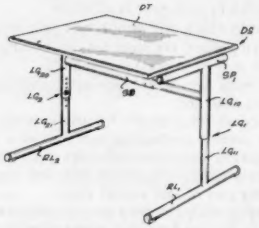


1. In a partially wood and partially metal pallet adapted for support by the tines of a forklift, said pallet including spaced and substantially parallel upper and lower platforms of wood and three substantially parallel and rigid metal cross beams disposed between and fixedly interconnecting said upper and lower platforms, two of said cross beams comprising elongated end beams disposed adjacent and extending substantially along the opposite edges of said pallet, and said other cross beam comprising a central beam disposed between said two end beams and extending substantially along the median axis of said pallet, comprising the improvement wherein said center beam comprises two spaced and substantially parallel cross bars located on opposite sides of said median axis and spaced a predetermined distance from each other, each of said cross bars being elongated and extending between and fixedly connected to the upper and lower platforms, each of said cross bars and end beams being identical and comprising an elongated metal member extending continuously throughout the length of the pallet and having substantially parallel upper and lower flanges and a single platelike web portion extending transversely between said flanges, the upper and lower flanges being fixed to the upper and lower platforms respectively, each of said cross bars and end beams having a pair of longitudinally spaced opening means extending transversely through the respective web portion thereof, the opening means in the end beams and cross bars being aligned to permit the tines of a forklift to be inserted between the upper and lower platforms of the pallet in a direction substantially perpendicular to the longitudinally extending direction of the cross beams, and each said opening means comprising a recess formed in each said elongated metal member and extending upwardly from the respective lower edge thereof and terminating at a location spaced downwardly from the upper flange of the respective metal member.

3,855,946
ADJUSTABLE LEG STRUCTURE

Emmett Robert Bales, North Manchester, Ind., assignor to American Standard Inc., New York, N.Y.

Filed Sept. 25, 1972, Ser. No. 291,865
Int. Cl. A47b *9/00*; **F16m** *11/26*
U.S. Cl. 108—144 **5 Claims**



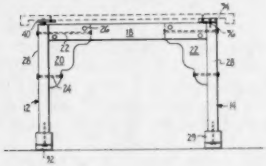
1. An article of furniture, such as a desk or table, comprising a table top, at least one horizontal tubular support to which the table top is affixed, at least one adjustable leg connected to each horizontal support, each leg being composed of upper and lower hollow non-circular cylindrical tubular leg segments which are of the same shape but of different cross-sectional dimensions so that the end of the smaller dimensioned leg segment is the lower segment and is telescopically slidable within the other leg segment thereby forming an elongated substantially vertical adjustable composited leg, each leg segment having a plurality of unthreaded apertures spaced from each other by a spacing which is the same for both leg segments and vertically arranged in alignment, and clamping means for fastening each pair of telescopically arranged leg segments to each other so that they will be sturdy and substantially free of play, said clamping means comprising a relatively thick L-shaped bar of uniform thickness, said bar being oriented in its upright position and proportioned so that its horizontal branch is slightly smaller in length than the internal cross-sectional dimension of the lower leg segment within which it is disposed and its vertical branch is elongated,

held and permanently affixed substantially entirely within the lower leg segment and parallel to the apertured inner wall of the lower leg segment, the vertical elongated branch of the bar having a plurality of threaded apertures which are spaced equally with those of both leg segments and vertically arranged in alignment and adjacent the apertures of both leg segments, and a threaded bolt or bolts each having a tapered unthreaded segment between its threaded segment and its head which is inserted through overlapping apertures of both leg segments and threadedly engaging a selected threaded aperture in said bar.

3,855,947
BASE CONSTRUCTION HAVING SELF-LEVELLING CAPABILITY

James M. Henley, 1620 Escobita, Palo Alto, Calif. 94306, and Earl C. Thordsen, 130 Fawn Ln., Portola Valley, Calif. 94025

Filed Oct. 10, 1972, Ser. No. 296,265
Int. Cl. A47b *13/00*
U.S. Cl. 108—161 **6 Claims**



1. A base for supporting a structure on a generally horizontal floor surface comprising first and second spaced apart rigid planar legs, said legs each having an upper edge and two laterally spaced floor surface contacting portions opposite said upper edge, first and second elongate beams spanning the space between said legs, means for rigidly fixing the longitudinal ends of said beams to said legs adjacent said upper edge so that said legs are supported in parallel spaced apart relation and so that substantial medial portions of the beams intermediate said longitudinal ends are unrestricted portions, said beams being parallelly spaced apart, said beams having a thickness to width ratio such that said unrestricted portions of said beams are flexually deformable in torsion with respect to the longitudinal axes thereof, so that said floor surface contacting portions can yield to conform to uneven floor surfaces, the width dimension of said beams being substantially vertical, and means for attaching said structure to said upper edges of said first and second legs.

3,855,948
FURNITURE WITH LOG-CABIN EFFECTS

Robert Salleroli, 351 E. 84th St., New York, N.Y. 10028

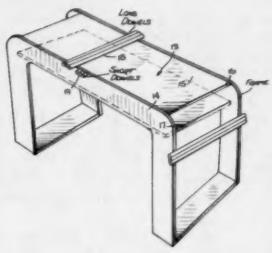
Filed Dec. 10, 1973, Ser. No. 423,246
Int. Cl. A47b *13/00*
U.S. Cl. 108—161 **7 Claims**

1. An article of furniture having a predetermined shape and exhibiting log-cabin effects, said article comprising:

A. a three-dimensional skeleton formed by at least one pair of spaced flat panels in parallel relation which are contoured and are joined together to create a structure whose profile conforms to the shape of the article, the spaces between the edges of the contoured panels defining the sides of the skeleton, the surfaces of the panels defining the faces of the skeleton,

B. a phalanx of long dowels longitudinally bonded to the sides of the skeleton, the extremities of the long dowels extending beyond the edges of the skeleton to form a protective bank outlining the boundaries of panel faces, and

C. a cluster of short dowels covering said panel faces, the inner ends of said short dowels being bonded to said faces, the length of the short dowels being equal to the

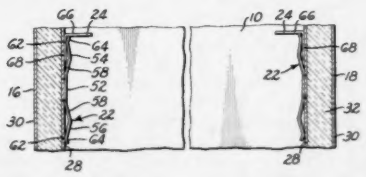


height of the bank whereby the exposed outer ends of the short dowels are coplanar with the ends of the bank to give the impression that the article is composed entirely of long dowels.

3,855,949
SECURITY BOX

Burnham Foster, 820 S. 2nd St., Alhambra, Calif. 91801, and Morton Schneider, 747 Chimineas Ave., Tarzana, Calif. 91356

Filed Mar. 28, 1973, Ser. No. 345,746
Int. Cl. E05g *3/00*
U.S. Cl. 109—23 **1 Claim**



1. In a security box of the type having a casing portion with an upright back panel, two opposing spaced apart horizontal, upper and lower side walls, and two opposing spaced apart vertical side walls, the four side walls extending forwardly from the back panel to form a storage chamber with a forward opening, the combination of:

a. a pair of mounting clips fixedly attached in the storage chamber to the vertical side walls, respectively, said mounting clips each having identical upper and lower retainer legs;

b. a pair of mounting brackets each having two arms, the first of which is removably engageable with said upper retainer leg of said mounting clip when the security box is in its normal position and which is removably engageable with said lower retainer leg when the security box is in an inverted position;

c. portable storage means resting in said storage chamber on the second of said arms of each of said brackets;

d. door means attached along one of said vertical side walls for opening and closing said storage chamber;

e. each of said brackets constituting an angle member having said first arm perpendicular to said second arm, with either of said first and second arms being engageable by either of said upper and lower retainer legs of said mounting clips;

f. said mounting clips each including a unitary spring clip having a flat central portion fixedly attached to one of

said vertical side walls, with said upper and lower retainer legs biased toward said one vertical side wall;

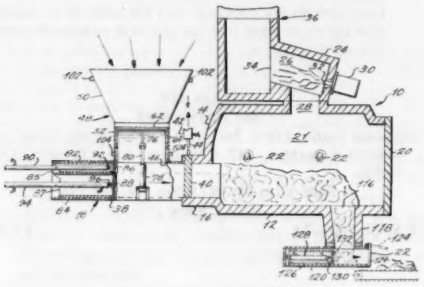
g. said retainer legs having transverse corrugations and each including an end bent away from said side wall for allowing entry of said first arm of said bracket and for supporting said second arm of said bracket; and

h. laterally protruding shoulder means between each of said ends of said retainer legs and said central portion, and formed by one of said corrugations, for holding said first arm of said bracket against one of said vertical side walls.

3,855,950
AUTOMATIC LOADING AND ASH REMOVAL SYSTEM FOR INCINERATORS

Carroll T. Hughes, Jr., and James K. Fishback, both of Richmond, Va., assignors to Consumat Systems, Inc., Richmond, Va.

Filed Oct. 10, 1973, Ser. No. 405,079
Int. Cl. F23g 5/12
U.S. Cl. 110—8 C **24 Claims**



1. A controlled air incinerator comprising:

a casing defining at least a main combustion chamber;

loader means for automatically loading said combustion chamber with waste material without materially affecting burning conditions within said main combustion chamber, said loader means including an elongated chute having one end opening to a lower portion of the combustion chamber and having an opening in its upper portion thereof remote from its opening to the combustion chamber for receiving waste material, a fire door positioned in a portion of said chute intermediate the waste receiving opening of said chute and the opening of said chute to said combustion chamber, said fire door being moved between a closed position across said chute and an opened position out of said chute, an upper elongated pusher member and a lower elongated pusher member in said chute and having a combined pushing area substantially equal to the cross-sectional area of said chute, at least said lower pusher member having a longitudinal length at least as great as the length of the waste receiving opening in said chute;

a hopper mounted on said loader chute over the waste receiving opening therein for feeding waste material by gravity to said chute in front of said pusher members;

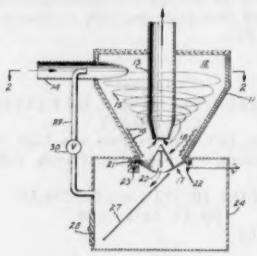
a first means to reciprocate said lower pusher member between a retracted position adjacent the waste receiving opening's rearward edge and an intermediate position where said lower pusher member is beneath the waste receiving opening in said chute when said upper pusher member is retracted while said door is open;

and means to simultaneously reciprocate said upper and lower pusher members when said hopper is empty between a retracted position adjacent the waste receiving opening's rearward edge and an extended position at least into the opening of the chute into the combustion chamber to entirely clear said chute.

3,855,951
CYCLONE INCINERATOR

Walter B. Giles, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 4, 1974, Ser. No. 439,211
Int. Cl. F23g 5/00
U.S. Cl. 110—8 R **11 Claims**



1. A cyclone incinerator for solid waste comprising

a vertically oriented cyclone separator having a closed upper end and an open lower end, a tangential inlet duct adjacent the upper end for admitting pneumatically propelled miscellaneous solid waste, and a centrally located exhaust duct extending vertically through said separator and out the upper end,

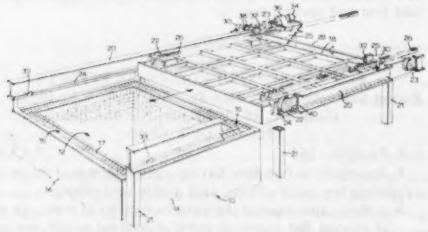
inclined kiln means substantially enclosing the lower end of said cyclone separator for supporting combustible components of the solid waste for further burning and for separating non-combustible and other components to drop by gravity into a residue chamber, and

a recirculation line connected between said residue chamber and inlet duct for recirculating unburned combustible particulates.

3,855,952
FURNACE COVER

Karl Sanderson, King City, Ontario, Canada, assignor to Lee Wilson Engineering Company of Canada Ltd., Downsview, Ontario, Canada, a part interest

Filed Nov. 8, 1973, Ser. No. 413,784
Claims priority, application Canada, Oct. 2, 1973, 182448
Int. Cl. F23m 7/00
U.S. Cl. 110—173 A **9 Claims**



1. In an industrial furnace having an upwardly opening well;

a pair of spaced apart, parallel, substantially horizontal rails;

a cover located between the rails and carrying journalled roller members movable along the rails;

at least one rack fixed on the cover;

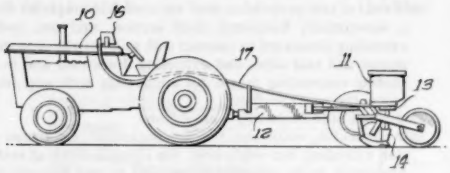
a pinion engaging the rack; and

fixed drive means connectable to rotate the pinion whereby the cover is movable laterally to close and open the well of the furnace.

3,855,953
CONTROLLED POPULATION PLANTER SYSTEM

George H. Fathauer, Decatur, and Wesley J. Bachman, Mount Zion, both of Ill., assignors to Dickey-john Corporation, Auburn, Calif.

Filed June 18, 1973, Ser. No. 370,773
Int. Cl. A01c 7/18
U.S. Cl. 111—1 7 Claims

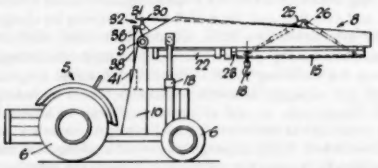


1. In a controlled population planter system, the combination including: a hopper for containing a quantity of seed, said hopper adapted to be connected to a vehicle for transport over the ground, a seed dispensing means associated with said hopper for planting the seeds as the hopper is transported over the ground, variable speed drive means, coupled to said seed dispensing means, seed detector means connected to said seed dispenser means for producing a first signal which corresponds to the number of seeds actually dispersed, distance measuring means for producing a second signal which corresponds to a predetermined distance travelled by said hopper over the ground, circuit means for receiving said first and second signals and producing a control signal in response thereto, selector means coupled to said circuit means for setting a predetermined seed population per unit area of ground over which said hopper is transported, and control means, coupled to said variable speed drive means and to said circuit means for receiving said control signal therefrom, said control means adapted to vary the speed of said variable speed drive means in response both to changes in the number of seeds actually planted and to variations in the rate of sensing said second signals from said distance measuring means, whereby a substantially desired density of seed population is maintained in accordance with the setting of said selector means.

3,855,954
JIB CRANES

Donald J. Quick, Queensland, Australia, assignor to International Harvester Company, Chicago, Ill.

Filed Sept. 17, 1973, Ser. No. 398,917
Claims priority, application Australia, Sept. 21, 1972, 519/72
Int. Cl. B66c 23/00
U.S. Cl. 212—8 R 2 Claims



1. In a crane having a jib pivotally mounted on a frame for pivotal movement about a horizontal axis, a hook supported on the jib, means for moving the hook along the jib for positioning the hook at a preselected horizontal distance from the axis, means for pivoting the jib about the axis, and means for actuating the hook moving means, wherein the improvement comprises:

a first link having a plurality of substantially straight telescopic segments and being pivotally connected at the opposite ends thereof respectively to the jib and to the moving means;

a second link having a plurality of crank arms and being pivotally mounted between the arms on the jib adjacent the axis;

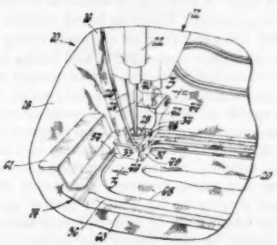
a third link having a substantially straight and rigid body and being pivotally connected at one end to one of the segments of the first link and pivotally connected at the opposite end to one of the crank arms of the second link; and

a fourth link having a substantially straight and rigid body and being pivotally connected at one end to another crank arm of the second link and pivotally connected at the opposite end to the actuating means for automatically operating the actuating means in response to pivotal movement of the jib for maintaining the hook at the preselected horizontal distance from the axis.

3,855,955
SEWING MACHINE APPARATUS

Karl H. Strang, Dearborn, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 31, 1974, Ser. No. 474,889
Int. Cl. D05b 35/06
U.S. Cl. 112—152 2 Claims



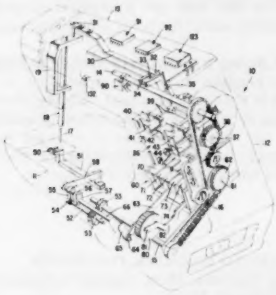
1. A sewing machine apparatus for sewing an elongated cloth strip onto a piece of cloth in a generally U-shaped configuration, the apparatus comprising, a sewing machine including a foot and a vertically reciprocal needle guided by the foot, a cloth guide for guiding the cloth strip below the needle, means rotatably supporting the cloth strip guide on the foot about the vertical axis of the needle and the cloth strip guide having a slide portion, a cloth clamp assembly including a pair of generally U-shaped clamp members connected to each other at the open ends thereof so as to be movable between a nonclamping position and a generally coplanar clamping position, the piece of cloth being clamped between the clamp members in the clamping position so as to leave an edge thereof exposed for sewing, and a U-shaped slide surface on the clamp assembly which is engaged by the slide portion of the cloth strip guide during relative movement between the sewing machine and the clamp assembly in the U-shaped configuration in which the cloth strip is to be stitched to the piece of cloth, this engagement controlling the rotational position of the cloth strip guide with respect to the sewing machine foot so as to thereby guide the cloth strip as it is stitched to the exposed edge of the piece of cloth within the U-shaped configuration of the clamp assembly.

3,855,956

SEWING MACHINE STITCH PATTERN GENERATION FROM STITCH DATA STORED IN STATIC MEMORY

John W. Wurst, Dover, N.J., assignor to The Singer Company, New York, N.Y.

Filed July 5, 1973, Ser. No. 376,780
Int. Cl. D05b *3/02*
U.S. Cl. 112—158 E 8 Claims



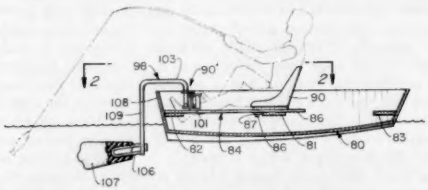
1. In a sewing machine having a stitch forming instrumentality variable in position over a predetermined range of positions between successive stitches to produce a pattern of stitches, a driving device operatively connected to impart movement to said stitch forming instrumentality over said predetermined range of positions in response to stitch pattern signals, a pulse generator driven in timed relation with said sewing machine for porducing an effective timing pulse between stitches, a counter responsive to said timing pulses from said pulse generator for producing output control signals in a progressive numerical code, a static memory means for storing data groups capable of being summed every combination of which is unique, means responsive to said progressive numerical code of said control signals for extracting said data groups from said static memory, means for summing each data group extracted from said static memory, and means effective to impress on said driving device a stitch pattern signal corresponding to the summation of each different data group extracted in response to said progressive numerical code of control signals.

3,855,957

SELF-PROPELLED BOAT

William J. Gross, 29105 Indian Valley Rd., Palos Verdes Peninsula, Calif. 90274

Division of Ser. No. 35,321, May 7, 1970, Pat. No. 3,695,211.
This application July 20, 1972, Ser. No. 273,380
Int. Cl. B63h *1/36*
U.S. Cl. 115—28 R 6 Claims



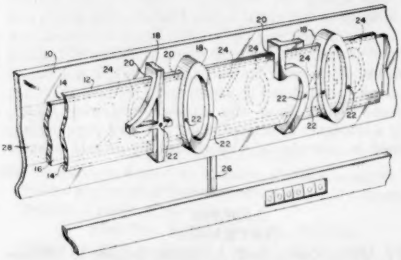
1. A mechanism for a self-propelled boat comprising:
a propelling mechanism and an occupant's seat;
frame means for supporting said propelling mechanism;
an upright support means attached to said frame means;
said propelling mechanism comprising a propulsion shaft carrying a cross member at one end and a propulsion fin at its other end, said propulsion fin being entirely constructed of a flexible material having memory to return to a straight configuration when at rest;
pivotal mounting means for pivotally supporting said shaft on said upright support means;
foot engaging areas at opposite ends of said cross member for angular movement of said propulsion shaft by the occupant seated in said seat in order to move said fin angularly through the water and propel the boat;
said ends of said propulsion shaft are connected together by a substantially horizontal shaft section, said one end extending downward to connect with said upright support means and said other end extending downward and including connecting means for connecting with said fin below the water surface;
said propulsion fin having a cavity; and
said connecting means comprising a projection, said projection extending into said cavity, the elongated axis of said projection being substantially parallel to said horizontal shaft section.

3,855,958

SPEEDOMETER ATTACHMENT WHICH PERMITS A DIRECT READING IN KILOMETERS PER HOUR FROM A MILES PER HOUR SCALE AND CONVERSELY

David Briscoe, Willemer Strasse 13, Frankfurt/Main, Germany

Filed Mar. 1, 1972, Ser. No. 230,560
Claims priority, application Germany, Mar. 4, 1971, 7108191[U]
Int. Cl. G01p *1/06*
U.S. Cl. 116—116 10 Claims



1. A kit for permitting the direct reading in a first unit length per unit time from a basic speedometer scale including an indicator and dial reading in a second unit length per unit time at least one of said second unit length and said second unit time being different from a corresponding one of said first unit length and said first unit time, said kit comprising an elongate member attachable to a basic speedometer scale, said elongate member having portions forming at least one elongate guideway for receiving indicia members moveable longitudinally of said elongate member, indicia members including a portion engageable in said elongate guideway to adjustably secure said indicia members on said elongate member, said indicia members being adjustably moveable along said elongate guideway, means for securing said elongate member to said basic speedometer scale such that said elongate member is superposed over the dial of said basic speedometer scale, and means for fixing the position of said indicia members in said guideway whereby, when said elongate member is attached to said basic speedometer scale, said indicia members can be fixed in position to read in said first unit of length per first unit of time where said scale reads in said second units of length per said second units of time.

3,855,959
INDICATING PUSH BUTTON FOR PUSH BUTTON SWITCHES

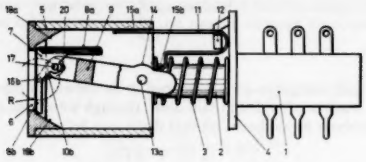
Klaus Hinze, Berlin, Germany, assignor to Firma Rudolf Schadow KG, Berlin, Germany

Filed July 25, 1973, Ser. No. 382,376

Claims priority, application Germany, Aug. 2, 1972, 2238091; Dec. 12, 1972, 2260733

Int. Cl. G09f 9/00

U.S. Cl. 116—124 R **10 Claims**



1. An indicating push button for a push button switch, said button comprising:

a housing having a front end with a window therethrough through which indicating surfaces in the housing may be viewed;

a drive mechanism is said housing comprising lever means; two alternately visible indicating surfaces pivotally attached to said lever means and being pivotable so that the one or the other of said surfaces becomes visible through said window;

said lever means having a first pivot axis fixedly located in said housing and about which said lever means is pivotable with respect to said housing, and means in said housing to pivot said surfaces upon pivoting of said lever means;

force applying means in said housing positioned to apply force upon said lever means to pivot it about said first axis; said force applying means being held stationary relative to motion of said housing;

said lever means being movable past said force applying means and said force applying means being positioned such that said force applying means applies force to said lever means first on one side of said first axis and then on the other side of said first axis, causing said lever means to pivot in one direction and in the opposite direction as said housing is shifted past said force applying means.

3,855,960
CONTROL DEVICE HAVING IMPROVED ADJUSTMENT INDICATING MEANS AND PARTS THEREFOR OR THE LIKE

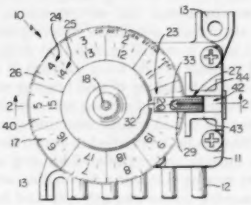
Edward N. Caldwell, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed July 25, 1973, Ser. No. 382,492

Int. Cl. G09f 9/00

U.S. Cl. 116—124 R **15 Claims**

1. In a control device having an adjustable means and a rotatable member for adjusting said means as said member rotates, the improvement comprising indicating means operatively associated with said rotatable member for indicating the adjustment being made to said adjustable means as said rotatable member is rotated more than 360°, said rotatable member having opposed sides, said indicating means comprising scale means carried on one of said sides of said rotatable member and a pointer means carried by said control device and having a part disposed over said one side of said rotatable member and cooperable with said scale means, said rotatable member having drive means on the other of said sides thereof, said pointer means having driven means disposed over said



other side of said rotatable member and operatively interconnected to said drive means to be driven thereby.

3,855,961
INDICATING PUSH BUTTON MECHANISM

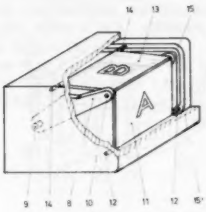
Rudolf Schadow, Konigsbacher Zeile, 23, Berlin 28, Germany

Filed Apr. 11, 1973, Ser. No. 350,031

Claims priority, application Germany, Apr. 27, 1972, 2220812

Int. Cl. G09f 9/00

U.S. Cl. 116—124 R **24 Claims**



1. An indicating push button mechanism having two indicator plates for indicating two different button positions, comprising:

a hollow push button housing; said housing having a viewing window thereinto through which the interior of said housing may be viewed;

two viewable plates in said housing for being moved such that a respective one of said plates is viewable through said window at each button position;

a lever in said housing; said lever being so supported in and being so movable in said housing that a portion of said lever is movable in said housing behind said viewing window and in a first direction across said window and also in a second direction opposite said first direction;

at least one of said plates being connected to said lever portion and being movable by said lever portion across said window in said first direction to a first position at which said first plate is oriented to be viewable through said window and in said second direction to a second position at which said first plate is moved away from said window and is oriented so as not to be viewable through said window;

said second plate being connected to said first plate such that one of said lever and said first plate selectively moves said second plate to a third position at which said second plate is not viewable throgh said window and at which said first plate is in said first position, and moves said second plate to a fourth position at which said second plate is viewable through said window and at which said first plate is in its said second position;

lever moving means in contact with said lever; said lever moving means being shiftable with respect to said lever upon movement of said housing with respect to said moving means; said housing being movable with respect to said moving means; said moving means and said lever being so shaped and positioned with respect to each other that said lever is moved in said first direction to a first terminal position of said lever which is at said first plate position through shifting of said housing in a third direction with respect to said moving means and such that said lever is moved in said second direction to a second terminal position of said lever which is at said first plate second position through shifting of said housing with respect to said lever moving means in a fourth direction with respect to said moving means and opposite said housing motion third direction.

3,855,962

CHANNEL INDICATING FOR TELEVISION RECEIVERS

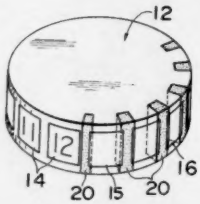
Kosaku Uchida, Neyagawa; Susumu Ide; Toshiji Kanamaru, both of Osaka, and Sadafumi Kitamura, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sept. 13, 1971, Ser. No. 179,851

Claims priority, application Japan, Sept. 14, 1970, 45-91427

Int. Cl. H03j *1/02*

U.S. Cl. 116—124.1 **6 Claims**



1. A channel indicating device for television receivers, for indicating, in a display window, a numeral of a channel to be used selected among a predetermined number of UHF channel numerals extracted from the entire UHF channel numerals and from among the entire VFH channel numerals, comprising indication members each thereof representing each of said extracted UHF channel numerals and being magnetically attractable; a rotary member, said VHF channel numerals being marked on the peripheral surface of said rotary member, and said rotary member being provided with mounting portions for mounting said indicating members; and magnets provided in said rotary member for attracting said indication members.

3,855,963

CHANNEL INDICATOR

Siro Tada, Chigasaki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

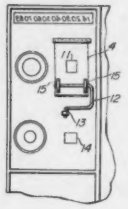
Filed Mar. 3, 1972, Ser. No. 231,559

Claims priority, application Japan, Mar. 5, 1971, 46-14589; Mar. 8, 1971, 46-15243

Int. Cl. H03j *1/02*

U.S. Cl. 116—124.1 **4 Claims**

1. A channel indicator comprising a rotating drum which can be rotated in response to the rotation of a tuner shaft, a plurality of numbered tabs disposed detachably on the periphery of said drum, the numbers on said tabs corresponding to predetermined channels, a swingable door provided in a control panel on the front side of a TV receiver set and spaced opposite and closely from a peripheral wall of said drum when said swingable door is normally closed, said swingable door being mounted at such a position that said tabs corresponding to the predetermined channels can be removed manually from the peripheral wall of said drum through said swingable door



when said swingable door is opened in an outward direction, and a window provided in said door, through which the channel numbers on said tabs on said drum can be seen.

3,855,964

CHANNEL INDICATING DEVICE FOR TELEVISION RECEIVERS

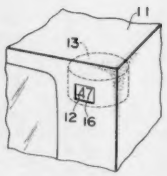
Kosaku Uchida, Neyagawa; Susumu Ide; Toshiji Kanamaru, both of Osaka, and Sadafumi Kitamura, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 27, 1971, Ser. No. 175,620

Claims priority, application Japan, Sept. 1, 1970, 45-87379; Sept. 14, 1970, 45-91428

Int. Cl. H03j *1/04*

U.S. Cl. 116—124.4 **7 Claims**



1. A channel indicating device, for use in a television receiver, for indicating, in a display window, a numeral of a channel selected among a predetermined number of UHF channel numerals extracted from the entire UHF channel numerals and among the entire VHF channel numerals, comprising indication members each thereof representing one of said extracted UHF channel numerals; a rotary member, said VHF channel numerals being marked on the peripheral surface of said rotary member, and said rotary member being provided with mounting portions for mounting said indication members; and a plurality of means provided on one of two groups comprising said indication members and said mounting portions, respectively, for releasably holding said two groups together.

3,855,965

AUTOMATIC BREADING DEVICE

Jerry D. Gordon, 10765 E. 11th St., Tulsa, Okla. 74120

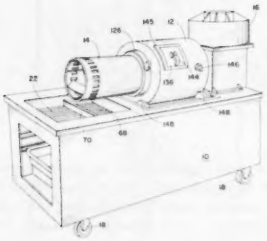
Filed June 21, 1973, Ser. No. 372,063

Int. Cl. B05c *5/02*; **A23l** *1/31*

U.S. Cl. 118—16 **4 Claims**

1. Apparatus for breading pieces of raw chicken or the like comprising a main cylinder rotatable about a horizontal central axis and having an apertured front circular wall, an apertured rear circular wall and an apertured circular partition within said main cylinder substantially parallel to and spaced between said front and rear walls, the space between said

circular partition and said rear wall defining an egg-wash chamber, the space between said circular partition and said front wall defining a flour chamber; a perforated cylinder mounted in said circular partition concentrically with said main cylinder and projecting into said egg-wash chamber; egg-wash scoop means mounted on the end of said perforated cylinder adjacent said rear wall; an elongated breading cylinder mounted in said front wall substantially concentric with said main cylinder and having a portion projecting into and through said flour chamber, the portion of said breading cylinder projecting into said flour chamber terminating adjacent said perforated cylinder, said breading cylinder having a portion projecting forwardly and externally of said main cylinder; a flour scoop mounted on the portion of said breading cylinder within said main cylinder and passing through an opening in



the wall of said breading cylinder; means for releasably locking said breading cylinder to said front wall of said main cylinder; and spiral vane means mounted in said perforated cylinder and in said breading cylinder throughout the combined lengths thereof; whereby, as said main cylinder is rotated about its horizontal central axis, pieces of raw chicken can be advanced from an opening in said rear wall through said perforated cylinder and said breading cylinder in series and discharged from the forward end of said breading cylinder and, whereby, as said main cylinder is rotated about its horizontal central axis, said egg-wash scoop means will cause egg-wash solution to pass through the perforation in said perforated cylinder onto said pieces of raw chicken and said flour scoop will cause flour to pass onto the surfaces of said pieces of raw chicken as they pass through said breading cylinder.

3,855,966

UNIVERSAL CHUCKING MECHANISM

Walter Panas, Millville, N.J., assignor to Wheaton Industries, Millville, N.J.

Filed Nov. 30, 1973, Ser. No. 420,365
Int. Cl. B05c *11/14*
U.S. Cl. 118—66 **18 Claims**

10. A system for coating arbitrarily shaped containers over a predetermined portion of their surface comprising:

a. a continuous horizontal conveyor;

b. a plurality of chucking mechanisms located periodically along said conveyor, each of said chucking mechanisms including

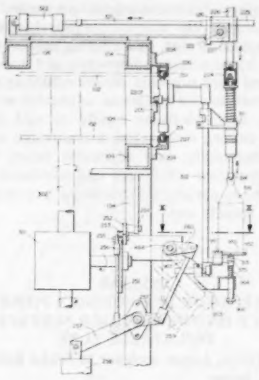
1. supportive frame means attached to said conveyor and including lower securement means,

2. upper securement means attached to said supportive frame means and positioned opposite to and above said lower securement means, said upper securement means including

A. plunger means slidably mobile toward said lower securement means, containers being secured in position between said lower and upper securement means by said plunger means, and

B. masking means concentric with said plunger means and independently slidably mobile to cover a specified portion of said containers;

c. first means located at at least one point on said conveyor for controlling the position of said plunger means, and



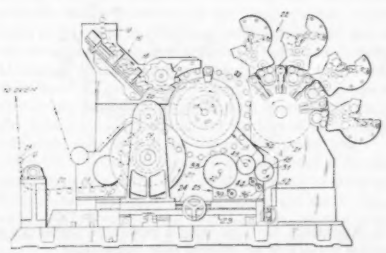
d. second means locsted at at least one point of said conveyor for controlling the position of said masking means.

3,855,967

OVERVARNISH UNIT FOR CONTINUOUS-MOTION DECORATING APPARATUS

John P. Skrypek, Saddle Brook, and Edward J. Whelan, Hasbrouck Heights, both of N.J., assignors to Sun Chemical Corporation, New York, N.Y.

Filed Mar. 21, 1973, Ser. No. 343,454
Int. Cl. B05c *1/02*
U.S. Cl. 118—230 **9 Claims**



1. Apparatus for operating on cylindrical containers, said apparatus including a main frame, a coating station on said frame, and conveyor means on said frame including spindles for carrying cylindrical containers along a feed path extending through said coating station whereby containers moved along said feed path receive a filmlike coating at an applicator nip in said coating station, said coating station having a coating mechanism including adjacent control and transfer metering elements forming a metering nip therebetween to receive a coating substance and produce a controlled thickness film of this substance on said transfer element, a transfer roll constituting said transfer element, an applicator roll for applying a coating of this substance to decorated containers, said applicator roll positioned adjacent said transfer roll and forming a transfer nip therebetween whereat the applicator roll receives the film from the transfer roll, first support means to which the control element is mounted, second support means to which the transfer roll and said first support means are mounted, and third support means to which the applicator roll is mounted, said third support means being adjustably mounted with respect to said main frame to adjust said applicator nip without operatively disturbing the transfer or metering nips, said sec-

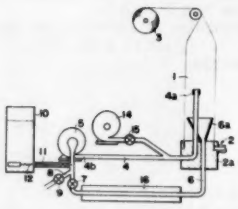
ond support means being adjustably mounted with respect to said main frame to adjust said transfer nip without operatively disturbing the metering or applicator nips, said first support means being adjustably mounted to said second support to adjust said metering nip without operatively disturbing the transfer or applicator nips, said coating mechanism also including a sub-frame interposed between said main frame and said second and third supports, means mounting said second and third supports to said sub-frame, adjustable means removably securing said sub-frame rigidly to said main frame whereby said coating mechanism is removable and replaceable as a subassembly, said adjustable means being constructed for operation which tilts said sub-frame relative to said main frame to parallel the cylindrical axis of the applicator roll to the spindle axes.

3,855,968

APPARATUS FOR DEPOSITING A POWDERED SUBSTANCE ON THE INTERIOR SURFACE OF AN INFLATABLE TUBE

Shiro Saito, Tokyo, Japan, assignor to Nikka Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 21, 1973, Ser. No. 427,047
Int. Cl. B05b *7/00*
U.S. Cl. 118—308 **7 Claims**



1. Apparatus for depositing a powdered substance on the interior surface of an inflated tube comprising

a. first conduit means having one end thereof opened into said tube,

b. second conduit means also having one end thereof opened into said tube,

c. a blower to which the other ends of said conduit means are connected for communication therebetween,

d. air feeding means, including a first valve means, for delivering air to said tube for inflating said tube when said first valve means is open,

e. a second valve means downstream of said air feeding means, said second valve means being closed when said first valve means is open, and adapted to be opened when said first valve means is closed, thereby to provide a continuous closed path of air circulation through said first conduit means, the inside of said tube, said second conduit means, and said blower,

f. means for supplying a powdered substance to one of said conduit means for delivery to the inside of said tube through said first conduit means, and

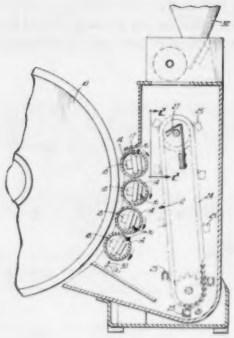
g. means for directing any undeposited particles of the powdered substance into the open end of said second conduit means in said tube for recirculation through said conduit means and back to said tube.

3,855,969

QUALITY CONTROL OF ELECTROSTATIC IMAGE DEVELOPER MIX

Thomas E. Andrako, Maple Heights, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Mar. 2, 1973, Ser. No. 337,340
Int. Cl. G03g *13/00*
U.S. Cl. 118—637 **2 Claims**



1. A magnetic brush apparatus for applying developing material to electrostatic latent images in a electrostatic printing machine of the type utilizing a moving photoreceptor surface, comprising;

a plurality of magnetic developing brushes each having a roller with a periphery upon which bristles of magnetic developing material are adapted to be formed.

said rollers each having an axis of rotation, said axis being substantially parallel to the path of the photoreceptor surface and aligned in a vertical array;

said rollers having a clear space therebetween and internal magnets within the rollers oriented in opposite polarities in one roller from that in the other and establishing a merging magnetic field bridging between the roller brushes to establish a continuous migrating magnetic blanket which accepts magnetic powder material at the first roller and transports the magnetic material between the rollers and the photoreceptor surface along the front face of the rollers in brush form and bridges between rollers in reclining array;

means for removing a portion but less than all of any magnetically attracted material from the topmost of the rollers in the vertical array whereby the remainder of the material will cling to that roller and proceed along the roller on the side thereof opposite said front path, allowing the retained material to migrate along the back side of the said array in the same form and action as the front but in the opposite direction; and

a cascade delivery system for supplying fresh mixture of developer material downward and against the back side of said array.

3,855,970

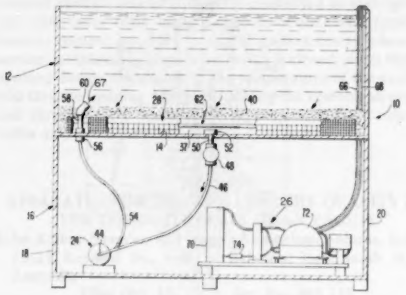
AQUARIUM

Lee M. Harwood, 304 Elm St., San Carlos, Calif. 94070

Filed Apr. 2, 1973, Ser. No. 347,034
Int. Cl. A01k *63/00*
U.S. Cl. 119—5 **8 Claims**

1. An aquarium comprising: a receptacle adapted to contain a quantity of water in which fish are to be placed, the receptacle having a bottom; means in the receptacle for forming a

water-receiving space adjacent to said bottom; a porous filter mounted on said forming means and disposed to permit water to pass into said space from a region above the filter; pump means coupled with the receptacle near the center of said bottom for drawing water out of the space; means coupled with said pump means for directing water therefrom back into the receptacle through the bottom near one end thereof and



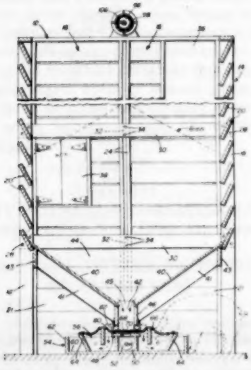
into said region along an inclined path from a location adjacent to the upper level of said filter; a tubular heat exchanger in said space for conditioning water therein when a conditioned fluid flows through the heat exchanger; and means externally of the receptacle and coupled to the heat exchanger for conditioning a fluid and directing the same through said heat exchanger.

3,855,971

COMBINATION GRANARY AND FEEDER FOR LIVESTOCK

Rollie O. Hess, R.F.D. 3, Moulton, Iowa 52572

Filed Dec. 27, 1973, Ser. No. 428,788
Int. Cl. A01k *5/02*
U.S. Cl. 119—52 AF **12 Claims**



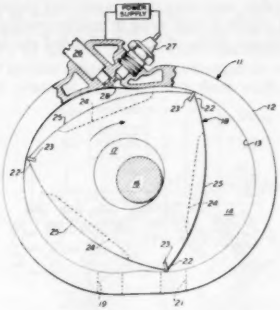
1. A feed handling structure comprising an upright elongated feed receiving bin, an elongated longitudinally extending feed discharge at the bottom of said bin for the downward discharge of feed from the bin, a feed moving conveyor in spaced underlying relation to said feed discharge, a livestock feeding trough also underlying said feed discharge, and means alternatively communicating said feed discharge with said feed moving conveyor or said feeding trough.

3,855,972

ROTARY COMBUSTION ENGINE WITH IMPROVED FIRING SYSTEM

Thomas C. Roberts, Ridgewood, N.J., assignor to Curtis-Wright Corporation

Filed Sept. 28, 1973, Ser. No. 401,562
Int. Cl. F02b *53/10, 53/12*
U.S. Cl. 123—8.09 **8 Claims**



1. A rotary internal combustion engine having a housing defining an engine cavity having intake and exhaust ports, a rotor rotatably disposed within the engine cavity and defining with the housing a plurality of working chambers of variable volume, the rotation of the rotor taking in fresh air at the intake port and compressing it in a compression zone, wherein the improvement comprises:

a. the housing having therein a cavity with a spark aperture communicating with the engine cavity, a fuel injector having a nozzle, means for mounting said fuel injector with the nozzle positioned in the housing cavity in proximity to the spark aperture and oriented to inject fuel into the compression zone therethrough, the nozzle bearing a U-shaped electrode with the legs of the U extending therefrom, a spark plug with an electrode projecting therefrom, means for mounting said spark plug with said electrode extending interjacent the legs of the U-shaped electrode and forming a spark gap therewith; and

b. an ignition system having one pole connected to the spark plug electrode and the other pole connected to the engine body so that the spark plug electrode and the U-shaped electrode are at opposite polarities, the ignition system firing a spark across the spark gap during the period of fuel injection.

3,855,973

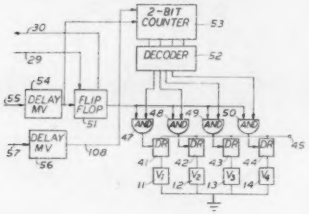
SYNCHRONIZING MEANS FOR SEQUENTIAL FUEL INJECTION

Bruce A. Scofield, Fort Wayne, Ind., assignor to International Harvester Company, Chicago, Ill.

Filed June 21, 1972, Ser. No. 265,046
Int. Cl. F02b *3/00*
U.S. Cl. 123—32 EA **5 Claims**

1. A fuel injection control system for an engine including a plurality of cylinders and fuel injection valve means associated with each cylinder for injection of fuel for flow into each cylinder during the intake stroke thereof, electrically energizable actuator means for each of said fuel injector valve means, spark plug means for each cylinder, ignition pulse generating means for generating an ignition pulse in predetermined phase relation to each and every power stroke of the engine, and distributor means for applying said ignition pulses to said spark plug means in sequence, said control system comprising: a sequencing circuit for supplying sequencing signals in synchronized relation to intake strokes of the engine, timer means for supplying timing signals, means responsive to said se-

quencing and timing signals for energizing said actuator means, said sequencing circuit having a plurality of stable states respectively corresponding to said actuator means and being arranged to be indexed from one state to another in a predetermined order and to develop in each of said states a sequencing signal for control of the corresponding actuator means in response to a timing signal from said timer means, index pulse means for supplying to said sequencing circuit an index pulse in predetermined phase to each and every power stroke of the engine to index said sequencing circuit from one state to another, and reset pulse means for supplying to said sequencing circuit a reset pulse in predetermined phase relation to the power stroke of a predetermined one of the engine



cylinders to reset said sequencing circuit to a predetermined initial state, said index pulse means being arranged for coupling to said ignition pulse generating means to develop and index in response to each ignition pulse, and said reset pulse means being arranged for coupling to said distributor means to develop a reset pulse in response to each ignition pulse applied to the spark plug means for said predetermined one of the engine cylinders, said index pulse means comprising a first monostable multivibrator, said reset pulse means comprising a second monostable multivibrator, said first and second multivibrators being triggered in response to ignition pulses from said ignition pulse generating means and said distributor means.

3,855,974

APPARATUS TO CONTROL THE AIR-FUEL MIXTURE SUPPLIED TO INTERNAL COMBUSTION ENGINES

Hartmut Mayer, Aidlingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 10, 1973, Ser. No. 322,568

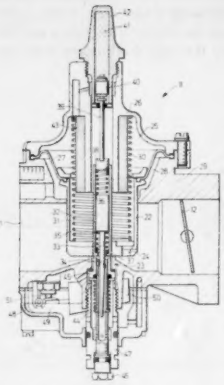
Claims priority, application Germany, Apr. 22, 1972, 2219768

Int. Cl. F02b *3/00*; **F02d** *1/04*

U.S. Cl. 123—32 EA **22 Claims**

1. Apparatus to control the air component and fuel component of the air-fuel mixture supplied to an internal combustion engine (**10**) having sensing means (**16**) sensing the composition of the exhaust gases and providing an electrical control signal, and a carburetor (**11**) having control means (**22, 23**) supplying fuel to the mixing chamber in dependence on commanded fuel requirements of the engine for mixture of a mixing chamber (**21**) the fuel component and the air component and for application to the engine

wherein the carburetor comprises means forming a fuel nozzle opening (**34, 73**), and a needle (**33, 71**) movable within the fuel nozzle, the nozzle opening, upon relative selective positioning of said nozzle and needle being electrically controllable and arranged to additionally control supply of fuel to the mixing chamber, and being connected to and controlled by said electrical control signal and operatively connected to the carburetor fuel supply means to additionally regulate the relative flow of the fuel component of the mixture with respect to the air component, independently of demand of fuel-air mixture by the engine, under control of said electrical control signal provided by the sensing means to adjust the mass ratio of the air and fuel components of the mixture being applied to the engine in dependence on the composition of the exhaust gases;



and wherein the fuel supply means includes an air pressure responsive piston (**22**) movably located in the path of the air stream supplied to the engine upon engine operation, the needle (**33, 71**) being slidably located in the piston (**22**) and movable under control of said control signal.

3,855,975

WARMING-UP APPARATUS FOR INTERNAL COMBUSTION ENGINE

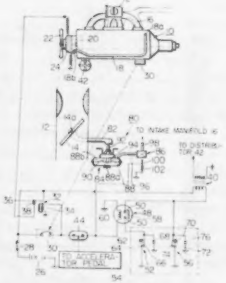
Kenji Masaki, and Yukihiro Etoo, both of Yokohama, Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Jan. 24, 1973, Ser. No. 326,267

Claims priority, application Japan, Jan. 25, 1972, 47-9369; Jan. 25, 1972, 47-9370

Int. Cl. F01p *7/02*

U.S. Cl. 123—41.13 **6 Claims**



1. In an internal combustion engine having an intake manifold, a water pump adapted to circulate and recirculate a coolant through a cooling circuit, a cooling fan and a carburetor with a throttle valve, a warming-up system comprising, in combination, a source of d.c. voltage supply, a coolant temperature responsive switch associated with the engine and electrically connected to said source of d.c. voltage supply, said coolant temperature responsive switch being closed when the temperature of the coolant in the cooling circuit is below a predetermined level, a relay switch electrically connected through said coolant temperature responsive switch to said source of d.c. voltage supply, said relay switch being closed

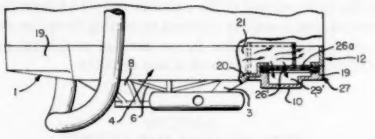
when said coolant temperature responsive switch is closed, an electro-magnetic clutch electrically connected to said relay switch and engaged when said relay switch is closed for stopping operations of said cooling fan and said water pump, a timer relay electrically connected to said coolant temperature responsive switch, an ignition timing change-over device comprising a retarding breaker contact assembly connected through said timer relay to an ignition coil and an advancing breaker contact assembly directly connected to said ignition coil, said timer relay being closed to actuate said retarding breaker contact assembly to retard ignition timing when said coolant temperature responsive switch is closed; and a throttle opening device responsive to the temperature of the coolant, said throttle opening device increasing the opening degree of said throttle valve when the temperature of the coolant is below said predetermined level.

3,855,976

APPARATUS FOR CONTROLLING THE QUALITY OF THE COMBUSTION AIR OF AN ENGINE

John Arthur Notaras, and Angelo Lambrinos Notaras, both of 15-21 Reynold St., both of Balmain, New South Wales, Australia

Filed Oct. 10, 1973, Ser. No. 405,117
Int. Cl. F02f *1/34*
U.S. Cl. 123—41.62 **6 Claims**



1. A self-cleaning air filtering apparatus in combination with an internal combustion engine having a fan mounted on the engine, said apparatus including a cover overlying said fan and a portion of the cylinder of said engine, said cover provided with an air intake adjacent said fan communicating with an air flow chamber within said cover extending toward said engine cylinder, said cover having an opening therethrough upstream from and adjacent said cylinder, a planar filter medium disposed over said cover opening, cover means overlying said filter medium and provided with a passageway communicating with a combustion air intake port of said engine whereby, air directed by said fan from said air intake through said air flow chamber to said engine cylinder sweeps across said planar filter medium in the direction of orientation of the planar filter to constantly scour foreign particles therefrom and direct them past said cylinder.

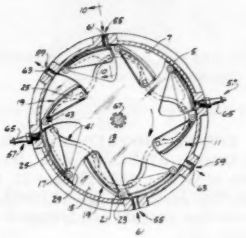
3,855,977

ROTARY INTERNAL-COMBUSTION ENGINE

Frank D. Statkus, 12804 N.E. 129th St., Kirkland, Wash. 98033

Filed May 1, 1973, Ser. No. 356,095
Int. Cl. F02b *57/00*
U.S. Cl. 123—43 C **4 Claims**

1. A rotary internal-combustion engine comprising a housing having a peripheral wall with a cylindrical internal surface and side walls defining a main chamber, a rotor rotary in one direction in said chamber, said rotor having multiple of four recesses in its periphery spaced at equal intervals therearound defining combustion chambers, portions of the rotor between said combustion chambers constituting partitions between said combustion chamber in sealing engagement at their outer periphery with said cylindrical internal surface, a plurality of pistons, one for each combustion chamber, carried by the rotor, each piston being pivotally connected at one end thereof to the rotor partition at the trailing end of the respective combustion chamber and extending toward the other end of the respective chamber constituting its leading end, each piston being in sliding sealing engagement at its sides with said side walls and at its free end opposite its pivoted end with said other end of the respective combustion chamber, cam follower means on each piston adjacent its said free end, at least one of said side walls having cam track means receiving said cam follower means, each piston being swingable inwardly for a power stroke and a fuel intake stroke and being swingable outwardly for a compression stroke and an exhaust stroke in the course of each one-half revolution of the rotor, said housing having air and fuel intake means, fuel ignition means and exhaust means at spaced intervals around said main chamber for delivery of air and fuel to each combustion chamber, ignition of air-fuel mixture in each combustion chamber, and exhaust of products of combustion from each combustion



chamber during each one-half revolution of the rotor, said cam track means having four apogees spaced at substantially equal angular intervals around said side wall and four corresponding perigees, one between each pair of adjacent apogees, so as to effect corresponding inward and outward movement of pistons diametrically opposed to one another and to effect two power strokes of each piston for each revolution of the rotor, said ignition means being spaced relative to two of said apogees diametrically opposed to one another so as to initiate combustion of said air-fuel mixture in two diametrically opposed combustion chambers as said free end of the piston of each of said opposed combustion chambers moves past its respective ignition means thereby to substantially simultaneously effect efficient combustion of said mixture in each of said opposed combustion chambers, and to effect the balanced application of power to opposed sides of said rotor.

3,855,978

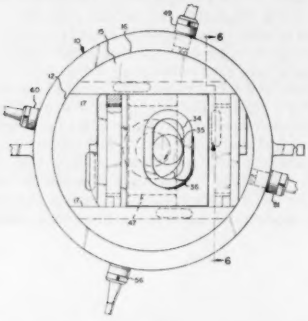
ROTARY INTERNAL COMBUSTION ENGINE

Raymond M. Becker, P.O. Box 157, Petoskey, Mich. 49770

Filed Aug. 29, 1972, Ser. No. 284,501
Int. Cl. F02b *57/06*
U.S. Cl. 123—44 C **29 Claims**

1. A rotary internal combustion engine including a housing, a cylindrical chamber having wall formed in said housing and being open at one end, an exhaust manifold sealing said chamber at said open end and forming the other wall thereof, a plurality of sectorial spacers cooperating with the side walls of said cylindrical chamber to define two perpendicular combustion chambers in the same plane, a piston slidably mounted in each of said combustion chambers, thereby dividing each chamber into two parts, both of said pistons having an offset center portion to clear the other of said pistons and being provided with a slot therein to receive a crankshaft and to rotate it, a crankshaft carried by said housing and operatively connected to each of said pistons with the rotational axis of said crankshaft being perpendicular to that of the pistons and the combustion chamber, means to introduce a fuel-air mixture into said chamber, means to ignite said fuel-air mixture

at the proper time, means to exhaust the products of combustion of said fuel-air mixture after burning, and means to cause



said pistons and said combustion chambers to rotate in the direction opposite said crankshaft.

3,855,979

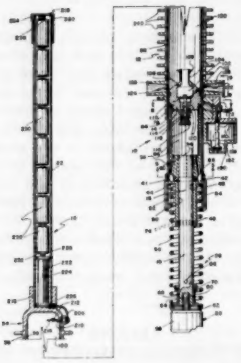
ENGINE POWERED JUMPING STICK

Herbert J. Ottaway, 3702 Elmwood Dr., Wichita, Kans. 67218

Division of Ser. No. 145,822, May 21, 1971, Pat. No. 3,715,600. This application Jan. 12, 1973, Ser. No. 322,924

Int. Cl. F01l *11/02*; **F02b** *71/00*

U.S. Cl. 123—47 A **14 Claims**



7. An internal combustion engine comprising an elongated hollow cylinder having first and second ends respectively closed by first and second end walls, an axially elongated piston having a hollow interior slidingly and sealingly reciprocable in said cylinder between first and second positions respectively adjacent the first and second ends of the cylinder, said piston having first and second ends respectively adjacent the first and second ends of the cylinder, said second end wall having a piston rod opening therethrough, a piston rod of less diameter than the piston slidingly and sealingly extending through said opening and having one end secured to the piston with its other end projecting axially from the second end of the cylinder, coiled compression spring means embracing the piston rod externally of the cylinder for yieldingly urging axial movement of the piston toward movement limiting engagement with the second end wall, a combustion chamber of a volume dependent upon the axial position of the piston defined within the cylinder between the piston and the first end wall, a first passageway means in the piston through the first end of the latter that communicates between the hollow interior of the piston and the combustion chamber, spring loaded check valve means for preventing fluid flow through the first passageway means from the combustion chamber to the hollow interior of the piston, an annular chamber of a volume dependent upon the axial position of the piston defined within the cylinder about the piston rod and between the second end of the piston and the second end wall, said piston having a multiplicity of openings therein constituting a second passageway means in the piston that communicates between the hollow interior of the piston and the annular chamber, said cylinder including a cylindrical side wall, means including a side wall having a fuel-air mixture inlet opening therethrough that is axially spaced intermediate the first and second end walls for introducing a fuel-air mixture into the annular chamber, means including said piston for closing said inlet opening except when said piston is adjacent its first position, means including said side wall having an exhaust opening therethrough that is axially spaced intermediate the first end wall and the inlet opening for exhausting combustion products from the combustion chamber, means including the piston for closing the exhaust opening except when the piston is adjacent its second position, and means for producing an electrical ignition spark within the combustion chamber in response to a predetermined movement of the piston adjacent the first position of the latter, said last means including said piston having a radially reduced central extension that extends toward the first end wall of the cylinder and which terminates in a free end, and a radially outward extending flange on the free end of the extension that has a circular peripheral portion concentric with the side wall of the cylinder.

3,855,980

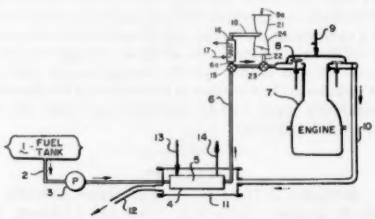
FUEL SYSTEMS FOR ENGINES

Paul B. Weisz, Yardley, Pa.; Nai Yuen Chen, Hopewell Township, and Stanley J. Lucki, Runnemede, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 13, 1970, Ser. No. 27,563

Int. Cl. F02b *43/08*

U.S. Cl. 123—3 **18 Claims**



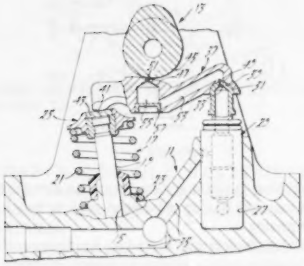
1. A combination of a combustion engine with means for the introduction of fuel into the engine for burning and operation of the engine, said means comprising a fuel tank containing fuel of relatively low octane number, means for passage of the fuel through a hydrocarbon catalytic converter operated at temperatures above about **600°F.** and means for passage of the effluent from the hydrocarbon catalytic converter into the engine for burning, said catalytic converter containing a crystalline aluminosilicate catalyst having a pore structure that has a shape selective preference for admitting linear hydrocarbons over hydrocarbons of other structural classes and having an alpha value of at least 5, wherein the relatively low octane number fuel is converted into relatively high octane number fuel for operation of the engine.

3,855,981

ROCKER ARM

Fred G. Loon, Taylor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 15, 1973, Ser. No. 360,489
Int. Cl. F01l 1/02, 1/04
U.S. Cl. 123—90.27 7 Claims



1. In an internal combustion engine having a cylinder head, a poppet valve assembly having a stem reciprocably mounted in said cylinder head, a camshaft rotatably mounted to said cylinder head, and a fulcrum member mounted to said cylinder head,

a rocker arm having a first end portion connected to said fulcrum member and a second end portion engageable with the end of said valve assembly,

said camshaft slidingly engaging said rocker arm at an area intermediate said end portions,

a passage formed in said rocker arm,

said passage having inlet means at said first end portion of said rocker arm,

said passage having outlet means formed in and located at the camshaft engaging area of said rocker arm,

said rocker arm receiving oil from said fulcrum member for discharge from said outlet directly against said camshaft.

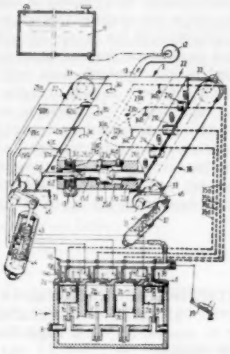
3,855,982

INJECTOR

Willem Brinkman, Velp, Netherlands, assignor to Holec N.V., Steenbakkersweg, Netherlands

Filed May 1, 1973, Ser. No. 356,185
Claims priority, application Netherlands, May 5, 1972, 7206081
Int. Cl. F02m 47/02
U.S. Cl. 123—139 AM 15 Claims

1. Injector for delivering fuel to at least two fuel inlets of a combustion engine with at least two combustion cylinders, comprising at least two pump chambers, each of said pump chambers communicating via an inlet valve with a fuel supply and via an exhaust valve with a fuel discharge to be connected to a fuel inlet of the combustion engine and each of said pump chambers being adjoined by a displacing member being displaceable to and fro over a pump stroke between two stops, said pump stroke being adjustable by means of control means, each displacing member being displaceable to and fro be-



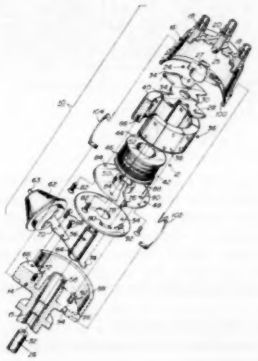
tween two common stops adjustable by means of control means.

3,855,983

MAGNETIC SENSOR DEVICE FOR IGNITION SYSTEMS

Robert J. Valek, Wheaton, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Mar. 26, 1973, Ser. No. 345,152
Int. Cl. F02p 7/06
U.S. Cl. 123—146.5 A 8 Claims



1. A magnetic sensor device in the ignition system for an internal combustion engine including in combination: rotatable shaft means of magnetizable material driven in synchronism with the rotation of the engine drive shaft, a first plate of magnetizable material, said plate having a plurality of radially extending arms, a permanent magnet structure having a cylindrical shape and comprising a plurality of permanent magnet sections, said magnet sections having north and south magnetic poles on opposite ends thereof, with alternate sections having opposite poles located adjacent each other, the number of said magnet sections being equal to twice the number of cylinders of the internal combustion engine and the number of said arms of said plate equaling one-half the number of said magnetic sections, a first end of said permanent magnet structure being mounted adjacent said first plate, a second plate of

magnetizable material mounted in spaced relation with respect to said first plate adjacent the oppoosite end of said permanent magnet structure, and sensor coil assembly means mounted concentrically with respect to said permanent magnet structure within the confines thereof, said rotatable shaft means extending through the centers of said second plate, coil assembly and permanent magnet structure, said first plate being coupled to and rotatable with said shaft means with respect to said permanent magnet structure in response to the operation of said engine for providing magnetic flux lines through said coil assembly varying between a predetermined positive amplitude and a predetermined negative amplitude, whereby an alternately poled output voltage is provided at said coil assembly for regulating the operation of said ignition system in accordance with the speed of said engine.

•

3,855,984

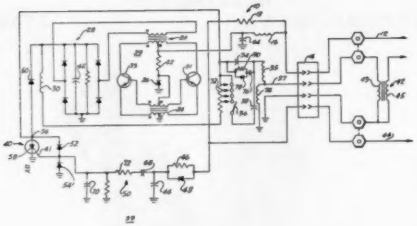
CAPACITIVE DISCHARGE IGNITION SYSTEM HAVING VARIABLE CAPACITANCE

Christopher A. Jacobs, 3570-1/2 Eagle Rock Blvd., Los Angeles, Calif. 90065

Continuation-in-part of Ser. No. 866,626, Oct. 15, 1969, Pat. No. 3,716,037. This application Nov. 29, 1972, Ser. No. 310,272

Int. Cl. F02p *1/00*

U.S. Cl. 123—148 E **4 Claims**



1. An ignition system for internal combustion engines comprising:

a source of electric power;

a first capacitor for storing electric power coupled to the power source;

a second capacitor connected in parallel circuit relationship with said first capacitor;

normally closed switching means connected in series circuit relationship with the second capacitor;

temperature sensing means operatively associated with said switching means for opening said switching means when engine temperature is above predetermined threshhold value to disconnect said second capacitor from the ignition system;

an ignition coil coupled to said first and second capacitors;

means coupled to the ignition coil for producing an electric spark;

an electronic switch coupled to the first and second capacitor for controlling the discharge and charge of the first and second capacitors; and

engine controlled switching means coupled to the electronic switch for periodically operating said switch to produce discharge of the capacitors.

3,855,985

BREAKERLESS IGNITION SYSTEMS

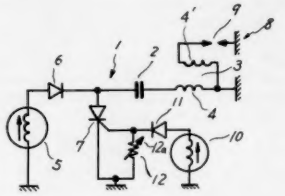
Kiyoshi Shirai, Numazu, Japan, assignor to Korusan Denki Co., Ltd., Shizuoka-Prefecture, Japan

Filed Mar. 28, 1973, Ser. No. 345,547

Claims priority, application Japan, Apr. 1, 1972, 47-37850[U]

Int. Cl. F02p *3/06*

U.S. Cl. 123—148 E **5 Claims**



1. A breakerless ignition system for use in an internal combustion engine and having advanced and delayed ignition phases, comprising:

a. a primary ignition circuit including a primary coil element of an ignition coil, a source to supply primary ignition current to said primary coil element of said ignition coil and a first controlled semi-conductor device to control the conduction of said primary ignition current to said primary coil element of said ignition coil;

b. a secondary ignition circuit including a secondary coil element of said ignition coil and an ignition plug connected to said secondary coil element of said ignition coil, said plug being disposed within a cylinder of said engine;

c. an ignition signal generator driven by said engine to produce an ignition signal in timing with the position of a piston in said cylinder; and

d. an ignition signal convertor connected between said ignition signal generator and said first controlled semiconductor device, said ignition signal convertor comprising a capacitor charged by said ignition signal generator, a Zener diode rendered conductive in response to predetermined voltage across said capacitor, a second controlled semi-conductor device rendered conductive upon conduction by said Zener diode, said capacitor thereupon discharging through the gate and cathode of said second controlled semi-conductor and through the anode and cathode of said first controlled semi-conductor and a variable electrical resistor connected to said capacitor to control charging of said capacitor by said ignition signal generator, said variable electrical resistor having a wiper movable in accordance with movement of the accelerator of said engine

so that when said accelerator moves to provide increased acceleration of said engine, said variable electrical resistor effects increased charging of said capacitor for the advanced ignition phase of said system and so that when the accelerator of said engine moves to provide increased deceleration of said engine, said variable electrical resistor reduces the charging of said capacitor for the delayed ignition phase of said system.

3,855,986

REFLECTIVELY COATED COMBUSTION CHAMBER FOR INTERNAL COMBUSTION ENGINES AND METHOD OF USING SAME

John W. Wiss, 3316 Brookdale Dr., Pittsburgh, Pa. 15241

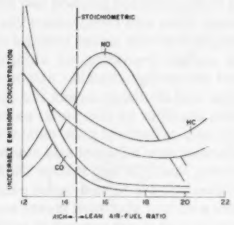
Filed Mar. 15, 1972, Ser. No. 234,857

Int. Cl. F02b *23/00*

U.S. Cl. 123—191 A **8 Claims**

1. A process for reducing noxious exhaust emissions from a spark-ignition engine comprising the steps of

providing an infrared reflecting surface highly reflective to infrared radiation in the 1 to 5 micron range to the walls of the combustion chambers of said engine while



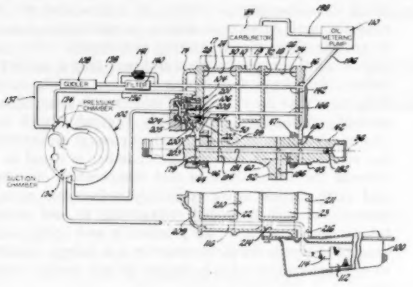
operating said engine at air-fuel ratios greater than 17 but less than 22.

3,855,987

ROTARY ENGINE OIL LUBRICATION SYSTEM

Raymond J. Green, Northville, and Erkki A. Koivunen, Livonia, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 14, 1974, Ser. No. 432,848
Int. Cl. F01m *1/02*; F01c *21/04*
U.S. Cl. 123—196 R **5 Claims**



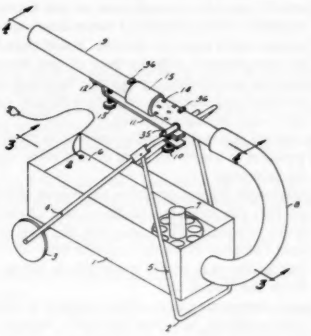
1. A rotary engine comprising a multipart housing including a rotor housing, an end housing having one side closing one side of said rotor housing and having an oppositely facing external side, another housing part closing the other side of said rotor housing, a crankshaft rotatably supported in bearings in said multipart housing, said crankshaft having an eccentric located in said rotor housing, a hollow rotor rotatably supported by a bearing on said eccentric, an internal tooth phase gear fixed to one side of and concentric with said rotor, an annular external tooth phase gear freely received about and concentric with said crankshaft and fixed to said end housing and meshing with said internal tooth gear, and a lubrication system comprising an oil tank secured to said multipart housing in an underneath location, an internal-external gear oil pump mounted about said crankshaft and secured to said external side of said end housing and having the external gear thereof driven by said crankshaft, said pump having a suction chamber and a pressure chamber, suction passage means in said multipart housing connecting said oil tank to said suction chamber, passage means in said crankshaft for distributing oil to said bearings and said phase gears for lubrication and also to the interior of said rotor for cooling, pressure passage means connecting said pressure chamber to said crankshaft passage means, drain passage means in said multipart housing for draining oil from said bearings and phase gears and the interior of said rotor to said oil tank, cooler means in said pressure passage means external of said multipart housing for cooling the oil prior to delivery to said bearings, said phase gears and the interior of said rotor, distribution pressure regulator valve means for regulating the oil pressure in said pressure passage means downstream of said cooler means at a predetermined value sufficient to provide adequate distribution to said bearings, said phase gears and the interior of said rotor over the engine's normal speed range, cooler pressure regulator valve means for regulating the oil pressure in said pressure passage means upstream of said cooler means at a predetermined value substantially higher than said regulated distribution pressure but lower than the pressure limit of said cooler means, and both said pressure regulator valve means having an exhaust passage directly open to said suction chamber of said pump for delivering oil overage from their regulating operations directly to said suction chamber of said pump in shunt relation to said oil tank.

3,855,988

BALL THROWING MACHINE

David C. Sweeton, Buffalo, N.Y., assignor to Prince Manufacturing, Inc., Princeton, N.J.

Filed Apr. 13, 1973, Ser. No. 350,696
Int. Cl. F41f *1/04*
U.S. Cl. 124—11 R **8 Claims**



1. A ball throwing device comprising a base embodying a stationary air box with an exterior open top portion defining a ball receiving tray, said tray having an inclined ball receiving floor with upstanding side and end walls circumscribing and extending above said floor, a support frame including a portion extending above said tray, a ball projection barrel supported on said frame, said barrel having an outer end through which the balls are projected and an inner end connected to one end of a flexible conduit with the other end of said flexible conduit being connected to said air box, a ball feed assembly including a plurality of cylindrical containers arranged in an annular side-by-side pattern each having an open top at the level of the floor of said tray for receiving a ball from said tray, wall means at the bottom of said cylindrical containers for supporting the balls in said containers except in an area adjacent the connection of said air box to said flexible conduit, a horizontal panel pivotally located below said area and being displaceable downwardly by the weight of a ball thereabove and being urged upwardly by the pressure of air in the air box to close the bottom of said cylindrical containers, said panel being releasable downwardly when a ball is in the cylindrical container to deposit each ball in succession into the air box directly adjacent the connection to said flexible conduit, means for rotating said ball feed assembly to feed balls in succession from said tray into said air box, fan means for pressurizing said air box, said conduit and said barrel to feed balls from said air box through said conduit to said barrel, and releasable detent means in said barrel for blocking the movement of the ball through said barrel until a predetermined air

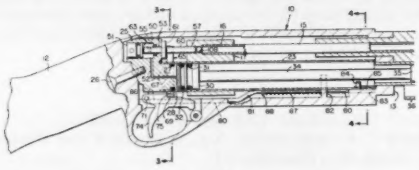
pressure is built up behind said ball to release the ball for projection out of said barrel.

3,855,989

PUMP-TYPE AIR GUN WITH TUBULAR VALVE MEMBER

David R. Hand, Rochester, N.Y., assignor to Crossman Arms Company, Inc., Fairport, N.Y.

Filed Dec. 20, 1972, Ser. No. 316,702
Int. Cl. F41b *11/00*
U.S. Cl. 124—13 A **10 Claims**



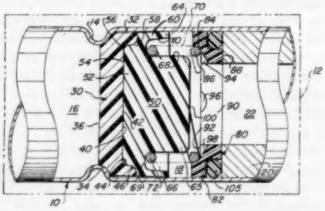
1. A pump-type air gun comprising
a frame having therein an air pressure chamber,
a barrel secured in said frame,
manually operable pump means on said frame for filling said chamber with a supply of compressed air,
a tubular valve member slidable in said chamber and having its bore aligned with the bore of said barrel,
means for positioning a projectile between said valve member and said barrel in registry with said barrel,
a valve seat in said chamber,
means for releasably holding said valve member in a cocked position in which the bore of said valve member is closed by said seat,
a releasable trigger operable to release said holding means so that the compressed air in said chamber moves said valve member off its seat and the compressed air from said chamber flows through the bore of said valve member to the rear of the projectile to propel the projectile from the barrel, and
means connecting said valve member to said pump means and operative to return said valve member to its cocked position each time said pump means is operated.

3,855,990

AIR GUN VALVE APPARATUS ASSEMBLY

Ronald W. Joyce, Springdale, and Ross T. Dozier, Rogers, both of Ark., assignors to Victor Comptometer Corporation, Chicago, Ill.

Filed Oct. 10, 1973, Ser. No. 405,134
Int. Cl. F41b *11/00;* **F41f** *1/04;* **F16k** *15/14*
U.S. Cl. 124—13 A **10 Claims**



1. In an air gun or the like having a variable volume air compression chamber and a piston means operable in the air compression chamber to compress air therein by movement from a retracted maximum volume position to an extended minimum volume position, the invention comprising:
a first elongated tubular means providing said air compression chamber,
a radially inwardly extending abutment means at one end of said compression chamber abuttingly receiving said piston means in the extended position and defining a central outlet passage from said compression chamber,
a second elongated tubular means having a cylindrical inner peripheral surface providing an elongated cylindrical compressed air storage chamber extending axially from and adjacent said abutment means and connected to said compression chamber by said outlet passage,
an axially movable cylindrical plate means mounted in said storage chamber next adjacent said abutment means and being movable axially in said storage chamber between a closed position relative to said outlet passage in abutting engagement with said abutment means and an open position relative to said outlet passage in axially spaced relationship to said abutment means,
said plate means having an abutment surface facing said abutment means and being engagable therewith in the closed position,
said plate means having a cylindrical outer peripheral surface of a diameter less than the inside diameter of said cylindrical inner peripheral surface of said second tubular means to provide first annular peripheral air passage means therebetween connecting said central outlet passage to said storage chamber,
annular sealing means associated and movable with said plate means having a cylindrical outer peripheral surface of a diameter less than the inside diameter of said cylindrical inner peripheral surface of said second tubular means to provide second annular peripheral air passage means therebetween connecting said central outlet passage to said storage chamber and including a resiliently deflectable skirt portion having a normal outside diameter greater than the diameter of said storage chamber and normally resiliently compressibly engagable with said second tubular means to seal said air passage means when the air pressure in said storage chamber is equal to or exceeds the air pressure in said compression chamber, said skirt portion being resiliently deflectable radially inwardly of and in spaced relationship to said second tubular means when the air pressure in said compression chamber exceeds the air pressure in said storage chamber to connect said air passage means to said storage chamber,
said plate means and said annular sealing means being loosely slidably supported in said storage chamber only by engagement between said cylindrical inner peripheral surface of said second tubular means and said outer peripheral surface of said plate means and said outer peripheral surface of said sealing means, and
spring means in said storage chamber operatively engaged with said plate means and said sealing means to bias said plate means and said sealing means toward the closed position whenever the air pressure in said storage chamber and the force of said spring means are greater than the air pressure in said compression chamber.

3,855,991

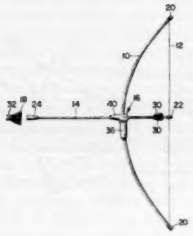
ARCHERY BOW WITH ARROW GUIDE MEANS IN HAND GRIP

Alexander Imatt, 1595 N. Calle La Cumbre, and Derek A. Brand, 2132 Lyndhurst Ave., both of Camarillo, Calif. 93010

Filed Dec. 6, 1973, Ser. No. 422,327
Int. Cl. F41b *5/00*
U.S. Cl. 124—24 R **1 Claim**

1. A missile projecting system in a bow and arrow comprising, a resilient bow, a bowstring, an arrow captured at one of its ends on the bowstring, an integral hand grip mounted on the bow and forming an arrow guide and a passage for the bow to pass therethrough, said grip having an arrow guide which is

spaced laterally from one side of the bow when the grip is mounted on the bow, and a missile releasably fixed to the free



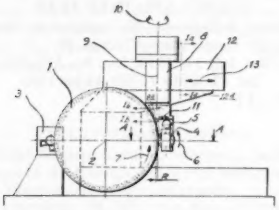
end of the arrow, the missile being a shuttlecock having a suction cup theron.

3,855,992

SHARPENING DEVICE FOR GRINDING WHEELS

Karl Tore Nordin, Lidkoping, Sweden, assignor to Lidkopings Mekaniska Verstads Aktiebolag, Lidkoping, Sweden

Filed May 2, 1973, Ser. No. 356,471
Claims priority, application Sweden, June 2, 1972, 7239/72
Int. Cl. B24b *53/06*
U.S. Cl. 125—11 CD **5 Claims**



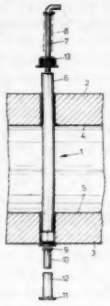
1. A device for sharpening a grinding wheel with a profile surface consisting of two straight line segments and an intermediate arcuate segment comprising a sharpening roller rotatably mounted in a support and having two peripheral sharpening surfaces disposed at a predetermined angle relative to one another and defining an edge at the radially outer rim of said sharpening roller, means mounting said support for rotation through a predetermined angle between first and second limit positions about an axis disposed parallel to a tangent to the surface of the grinding wheel, one of said sharpening surfaces contacting one of the straight line segments of the grinding wheel when said support is located in said first limit position and the other of said sharpening surfaces contacting the other straight line segment of said grinding wheel when said support is located in said second limit position, and said rim of said sharpening roller contacting said arcuate segment of the grinding wheel when said support is rotated between said limit positions.

3,855,993

RADIATING TUBE BURNER

Karl-Heinz Burmeister, Kleve, Germany, assignor to Ipsen Industries International, Gesellschaft mit beschrankter Haftung, Kleve, Germany

Filed Mar. 18, 1974, Ser. No. 452,283
Claims priority, application Germany, Mar. 17, 1973, 2313421
Int. Cl. F23c *3/00*
U.S. Cl. 126—91 A **14 Claims**



1. A radiating tube burner assembly for the continuous combustion of fuel gas with air, the burner assembly being mountable across spaced upper and lower walls of a furnace and comprising in combination:

an upright elongated tubular outer shell having an open upper end;

a combustion air feed pipe of a much smaller diameter than said shell extending through the upper end thereof along the longitudinal axis of the shell and having an open lower end positioned a distance above the lower end of the shell;

a combustion air inlet connection on the upper end of said air feed pipe;

a burner head mounted inside said outer shell a distance above the lower end of said air feed and surrounding the latter in such a way as to define an air flow passage therebetween;

a flow reversing shell extending downwardly from said burner head and enclosing the portion of the air feed pipe which reaches below the burner head so as to define an air flow channel between said pipe and the inner wall of said shell, which channel leads upwardly from the open lower end of said pipe to said air flow passage inside the burner head;

a fuel gas inlet at the lower end of said outer shell;

a fuel gas flow channel surrounding the outside of said flow reversing shell and leading upwardly inside said outer shell from the fuel gas inlet to the burner head; and

means for mixing the upwardly flowing combustion air and the surrounding likewise upwardly flowing fuel gas for combustion above the burner head in the space defined between said air feed pipe and said outer shell.

3,855,994

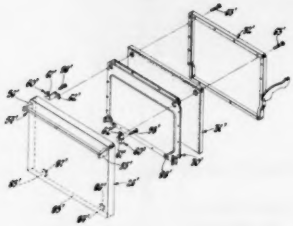
VENTILATED WINDOWED OVEN DOOR

Jesse L. Evans, Tipp City, and Eugene L. Hecker, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 379,725, July 16, 1973, Pat. No. 3,818,890. This application Mar. 27, 1974, Ser. No. 455,295
Int. Cl. F24c *15/04*
U.S. Cl. 126—198 **2 Claims**

1. A cooking oven door in combination with a domestic range; said door including an outer cover panel having rear-

wardly directed top, side and bottom peripheral flanges, an inner double-walled box-casing located in spaced partially nested relationship with said outer cover panel top and side peripheral flanges; said double-walled box-casing including a rear pan-shaped panel and a face panel, said rear pan-shaped panel having a forwardly extending first peripheral flange and an inwardly extending second peripheral flange, said face panel positioned in parallel spaced relationship to said rear panel and substantially coextensive in planar extent therewith such that the marginal portion of said face panel abuts said rear pan-shaped panel second peripheral flange, a plurality of threaded fasteners positioned around said marginal portion securing said second peripheral flange to said face panel to form said double-walled box casing, paired upper and lower



attachment means securing said cover panel in spaced relation to said box casing, each of said upper pair of attachment means extending longitudinally through apertures in said face panel from the inner face of said cover panel to the outer face of said pan-shaped panel, threaded fastener means for connecting the ends of said upper attachment means between said cover and pan-shaped panels, said lower attachment means in the form of clip means fastened to the face panel and the adjacent side peripheral flange of said cover panel, said cover panel bottom peripheral flange free edge forwardly offset from said face panel whereby ambient air enters the space therebetween to rise by convection currents between said cover penal and said box-casing to exit through the space between said cover panel top peripheral flange and said box-casing.

3,855,995

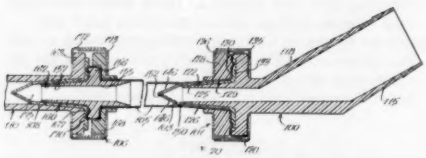
VENTRICLE ASSEMBLY FOR PULSATILE-TYPE PUMP

Donald J. Bentley, Newport Beach, Calif., assignor to Bentley Laboratories, Inc., Irvine, Calif.

Continuation of Ser. No. 171,924, Aug. 16, 1971, abandoned. This application Sept. 11, 1973, Ser. No. 396,198

Int. Cl. F16k *15/00;* **A61b** *19/00*

U.S. Cl. 128—1 D **23 Claims**



1. A pulsatile heart pump assembly, comprising: a chamber, means reciprocal in the chamber, a ventricle assembly at least partly in the chamber including an inlet fitting, an elongated leaflet valve wider than the inlet fitting and having a hydraulic radius substantially equal to the inlet fitting in the normally open position of the valve, a ventricle surrounding at one end said inlet fitting and adapted to be filled with blood, an outlet valve at the other end of the ventricle, and an outlet fitting communicating with said outlet valve.

3,855,996

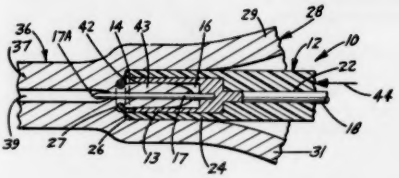
CONTRACEPTIVE APPARATUS AND PROCEDURE

Lee R. Bolduc, St. Louis Park, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 1, 1973, Ser. No. 337,071

Int. Cl. A61b *19/00*

U.S. Cl. 128—1 R **15 Claims**



1. An instrument for implanting an annular device in tissue around the canal of a Fallopian tube to close the canal of the Fallopian tube comprising: first means for making an annular incision in the tissue around the exit section of the canal of the Fallopian tube, said first means having a member for carrying an expanded annular device and knife means for cutting the annular incision in the tissue, and second means movable relative to the first means for moving the annular device from the member and into the annular incision in the tissue around the canal whereby said annular device contracts closing said canal.

10. A method of closing the canal of a Fallopian tube with an annular device comprising: making an annular incision around the exit portion of the canal of a Fallopian tube from the uterine cavity, placing an expanded annular device in the annular incision and allowing the expanded annular device to contract to close the canal of the Fallopian tube.

3,855,997

STERILE SPECIMEN TRAP

Philip H. Sauer, Bolingbrook, Ill., assignor to Cinco Medical Health Supply Corporation, Chicago, Ill.

Filed July 11, 1973, Ser. No. 378,349

Int. Cl. A61b *10/00;* **A61m** *1/00*

U.S. Cl. 128—2 F **8 Claims**

1. A sterile specimen trap particularly adapted for use in obtaining a fluid specimen and maintaining said specimen in a sterile condition for laboratory analysis comprising:

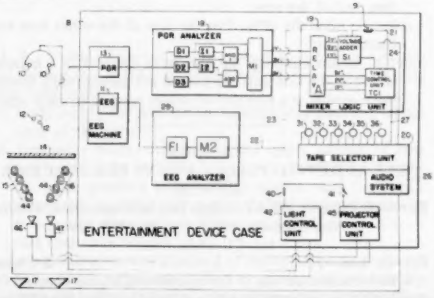
container means open at one end to receive said fluid specimen, and closure means mounted over said open end of said container means to close and seal the interior of said container means and prevent contamination of said interior of said container means, said closure means including a first annular cover member and a second annular cover member, said second cover member being mounted on said first cover member, said second cover member and, said first cover member being angularly movable relative to one another about a concentric central axis, each of said cover members having a pair of correspondingly spaced openings formed in them to communicate the interior of said container means with fluid specimen conduit means and suction conduit means, respectively, when said openings are aligned, said second cover member being held in a stationary position relative to said specimen conduit means and said suction conduit means by cover retaining means, said cover retaining means comprising an adapter cap having open end portions of said fluid specimen conduit means and said suction conduit means mounted thereon and opening therethrough, said adapter cap means being mounted on said first cover member in such a manner that said second cover member is sandwiched between said adapter cap and said first cover member and said open end portions of said fluid conduit means and said suction conduit means are aligned with said openings formed in said second cover member, a portion of said second cover member engaging said adapter cap to prevent movement of said second cover member relative to said adapter cap, said first cover member and said second cover member thereby being angularly movable relative to one another to align the openings formed in said first cover member with the openings formed in said second cover member to communicate said fluid conduit means and said suction conduit means to the interior of said container means to trap the fluid specimen therein, said first cover member and said second cover member being alternately movable in an opposite manner relative to one another, after a desired amount of the fluid specimen has been trapped in said container means, to close said openings and eliminate communication to the interior of said container means to preserve the sterility of the specimen trapped in said container means.

3,855,998

ENTERTAINMENT DEVICE

Miguel Hidalgo-Briceno, Caracas, Venezuela, assignor to Antonia Aagaard de Hidalgo and Luigi Mari Nolfi, both of Caracas, Venezuela, part interest to each

Filed Mar. 14, 1973, Ser. No. 341,284
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.1 B **5 Claims**



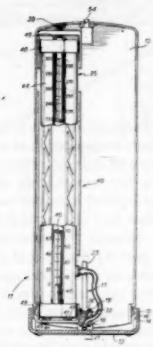
1. An entertainment device comprising, in combination, means presenting stimuli to a user, said means presenting stimuli to a user having tapes with musical passages thereon, a tape selector unit, an audio system for playing tapes selected by said tape selector unit to a user, a screen, means directing visual color stimuli of higher and lower intensity on said screen for viewing by a user, and a logic unit controlling said tape selector unit to play selected tapes for given time intervals while simultaneously controlling said means directing visual color stimuli on said screen to direct a visual color stimulus of selected intensity on said screen; and monitoring means read after each time interval by said logic unit, said monitoring means being at least an EEG machine monitoring the presence and absence of theta waves of a user and monitoring the small, medium, and large PGR of a user, said moinitoring means on being read by said logic unit activating said logic unit to control said tape selector unit to select one of said tapes for said audio system to play a given musical passage thereon and to control said means directing visual color stimuli on said screen to direct a visual color stimulus of a selected intensity on said screen while said musical passage is played according to the monitored large, medium, and small PGR and the presence and absence of theta waves of the user to urge the user toward a desired state of aesthetic experience.

3,855,999

SPHYGMOMANOMETER

Mario Saenz Arroyo, Mexico City, Mexico, assignor to Articulos Medicos Mexicanos, S.A., Mexico City, Mexico

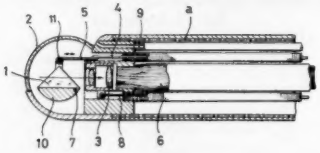
Filed Mar. 14, 1973, Ser. No. 341,177
Claims priority, application Mexico, May 30, 1972, 135791
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05 G **5 Claims**



1. In the combination of a compact case and an integral, removable sphygmomanometer, wherein the case includes a base and a lid held together at respective ends by a combination of a hinge and pivotal means and closure means at the opposite end of said base and said lid; and wherein the sphygmomanometer includes a manometer with a mercury reservoir and a measuring tube held in support device having a scale alongside said measuring tube, wherein said support means has means to connect said reservoir to a bracelet which in turn has means to connect it to a manually operated pump; the improvement comprising a manometer supporting device having one disc element at its upper end and two disc elements at its lower end with centrally located recesses in said discs; said supporting device having at its upper back end movable hook means; said lid having an integral housing structure to lodge said supporting device; said structure including at its bottom upper surface two protuberances that correspondingly engage said recesses of the two lower disc elements of said supporting device; said structure having at its upper end centrally situated screw means that mates with said recess of the upper disc element of said supporting device, that becomes

fixedly attached to said structure when said screw means is driven downwards; said supporting device having detachable hose means that connects said reservoir with said bracelet which in turn has non-detachable hose means connecting the same with said pump; said detachable hose means being passed through loop guide means; said pivotal means including a reactive helical spring having oppositely projecting ends, one of which presses against said lid to hold it in its open position, while the other spring end presses against a bottom part of a spring supporting piece from whose bottom said hose guide means projects; said base having at one of its inner side walls a combination movable fastening plate coupled by pivotal means to an inner side wall portion of said base and a clamping device to hold down said non-detachable hose and a neck portion of said pump, respectively.

3,856,000
ENDOSCOPE
Toshio Chikama, Tokyo, Japan, assignor to Kabushiki Kaisha Machido Seisakusho, Tokyo, Japan
Filed May 16, 1973, Ser. No. 360,945
Claims priority, application Japan, June 19, 1972, 47-71361
Int. Cl. A61b *1/06*
U.S. Cl. 128—6 **7 Claims**



1. An endoscope comprising a tube having a front end with an observation window thereat, said window having a front observation surface and one side observation surface, optical means in said tube for transmitting light and images therethrough, a pivotal optical element supported in said tube between said window and said optical means for transmitting an image viewed through the window back to the optical means, means for moving the optical element between a first position for receiving an image through the front observation surface and a second position for receiving an image through the side observation surface, and a shading plate displaceably supported in the tube for movement with the optical element for blocking passage of incident light to said optical element from said side surface when the optical element is in said first position.

3,856,001
LARYNGOSCOPE BLADE
Otto C. Phillips, 143 Jefferson Dr., Pittsburgh, Pa. 15228
Filed Aug. 24, 1973, Ser. No. 391,462
Int. Cl. A61b *1/26*
U.S. Cl. 128—11 **4 Claims**

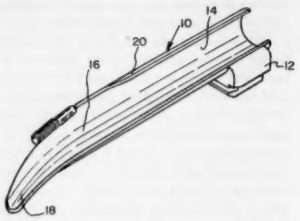
1. A laryngoscope blade suitable for performing an endotracheal intubation comprising:

A. an elongated, transected tube-shaped member having means on one end for attachment to a handle;

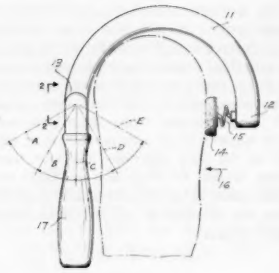
B. a major part of the length of the member being substantially straight and a minor part of the length beginning at a point approximately two inches from the opposite end of the member being smoothly curved and forming a tip on the opposite end of the member,

C. said opposite end being smoothly tapered inwardly toward the tip such that the blade can be inserted in a patient's pharynx and an endotracheal tube can be inserted through the tube-shaped member, and

D. to provide direct visualization of the larynx, a lamp positioned on the left-hand side of the tube-shaped member (as viewed by a patient) and focused in the direction of the smoothly curved tip.



3,856,002
MASSAGE DEVICE
Josie Matsumoto, Toronto, Ontario, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Aug. 28, 1973, Ser. No. 392,280
Int. Cl. A61h *7/00*
U.S. Cl. 128—67 **2 Claims**



1. A message device for massaging parts of the body which are difficult to reach, said message device comprising

a substantially arcuate arm having spaced free ends substantially opposite each other;

a massaging head member resiliently affixed to one free end of the arm and extending in a direction toward the other free end of the arm;

a handle pivotally affixed to the arm at the other free end thereof; and

detent means coupling the handle to the arm in a manner whereby the arm and the handle are substantially fixedly positionable at a plurality of angles relative to each other.

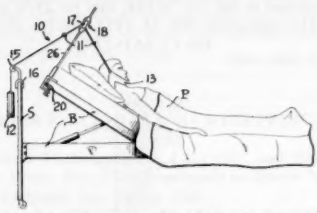
3,856,003
SELF ADJUSTING PULLEY MOUNT FOR TRACTION DEVICE
Harold P. Pfluger, 340-6T Vallejo Dr., Millbrae, Calif. 94030
Filed Sept. 21, 1973, Ser. No. 399,289
Int. Cl. A61h *1/02*
U.S. Cl. 128—75 **2 Claims**

1. In a traction device of the type having a sling adapted for connection to the extremity of a patient in a bed support and the like on which a pulley is affixed to a bedstead and over which a cable secured to such sling is trained and having a weight at its opposite end for creating traction beneficial to such patient:

A self adjusting feature including a base adapted to be secured to the adjustable backrest of such bed for movement therewith between its inclined and horizontal positions; between the sling and fixed pulley of such traction device and comprising in combination therewith:

a. a rod fixed to and extending upwardly from said base;

b. a pulley mount arranged for up and down movement on said rod and having a pair of pulleys journaled one above the other on axes perpendicular to said rod whereby a lowermost one of said pulleys engages said cable when the backrest is inclined and the uppermost



pulley engages the cable when the back rest is horizontal;

c. a C clamp for said pulley mount for securing the same to said rod in a position to afford in-line traction to the extremities of the patient connected to said sling; and

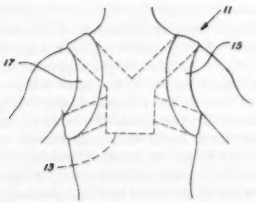
d. a pivotal connection between said C clamp and said pulley means facilitating swinging movement of the latter about an axis parallel to said rod to compensate for change of position of the sling end of said cable within the bed by reason of movement of the patient therein.

3,856,004

CLAVICLE BRACE

Wayne H. Cox, Pontotoc, Miss., assignor to Comfort Care Products, Pontotoc, Miss.

Filed Dec. 26, 1973, Ser. No. 427,995
Int. Cl. A61f *5/04*
U.S. Cl. 128—87 R **7 Claims**



1. A clavicle brace for giving support to a patient's shoulders during the healing of an injured clavicle, said clavicle brace comprising:

a. body means for positioning substantially over the upper back of the patient;

b. first strap means attached to the upper portion of said body means for extending over one shoulder and uncer the corresponding axilla of the patient, said first strap means having a distal end including fastening means thereon for allowing it to be fastened to other portions of said first strap means;

c. second strap means attached to the upper portion of said body means adjacent said first strap means for extending over the other shoulder and under the corresponding axilla of the patient, said second strap means having a distal end including fastening means thereon for allowing it to be fastened to other portions of said second strap means;

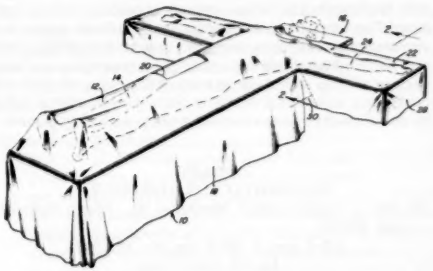
d. coupling means attached to said body means below said first and second strap means for allowing the distal ends of said first and second strap means to extend therethrough after passing under the respective axilla of the patient and to be subsequently doubled back on themselves for allowing said fastening means to attach said distal ends of said first and second strap means to other portions of said first and second strap means, said coupling means including a first leg, a second leg, and a third leg joined together to form an equilateral triangle; said first leg being substantially fixedly attached to said body means, said second leg depending downwardly from said first leg for allowing said distal end of said first strap means to be doubled therearound, and said third leg depending downwardly from said first leg for allowing said distal end of said second strap means to be doubled therearound.

3,856,005

LAPAROTOMY SHEET WITH EXTENDED WING SECTIONS

Robert J. Sislian, Brielle, N.J., assignor to Work Wear Corporation, Cleveland, Ohio

Filed May 9, 1973, Ser. No. 359,212
Int. Cl. A61f *13/00*
U.S. Cl. 128—132 D **1 Claim**



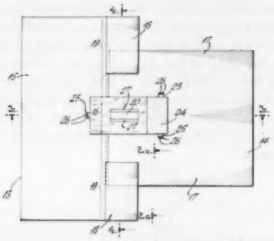
1. A surgical drape for positioning in overlying and protective relation to a patient and a generally rectangular surgical table provided with armboards projecting perpendicularly therefrom for receiving the arms of the patient for protecting the patient against contamination during a surgical procedure, said drape comprising a generally rectangular main body panel adapted to overlie the table and the patient from head to toe, and wing sections extending generally perpendicularly from the main body panel of the drape for overlying the arms of the patient and the armboards of the table, said main body panel and wing sections including peripheral edge portions hanging downwardly over the peripheral edge of the surgical table and armboards, said area of the drape where the wing sections join the main body panel including added material to provide a gusset area interconnecting the portions of the main body panel and wing sections hanging over the peripheral edge portions of the surgical table and armboards to define a gusset to enable the portion of the drape in this area to hang substantially vertically downwardly throughout the perpendicularly arranged edges of the table and armboards defining the included angle therebetween thereby enabling a surgeon to move into this area adjacent the body of the patient without pulling the drape from protective relation to certain areas of the body of the patient.

3,856,006

SURGICAL DRAPES WITH IMPROVED ARM COVERAGE

Henrietta K. Krzewinski, Old Bridge, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Aug. 2, 1973, Ser. No. 384,842
Int. Cl. A61b *19/06*
U.S. Cl. 128—132 D 9 Claims



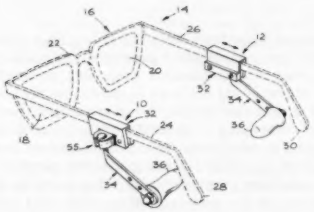
1. A generally T-shaped surgical drape for use on an operating table having a laterally extending board for supporting a patient's arm, said drape comprising an elongated, generally rectangular body portion having top and bottom ends and a pair of side edges, an elongated rectangular crossarm portion having top and bottom ends and side edges, said crossarm portion being disposed transversely of said body portion, the top end of said body portion being shorter than and integral with the bottom end of said crossarm portion, and an armboard flap having top and bottom ends and side edges, said armboard flap extending along the bottom end of said crossarm portion from a side thereof to a point overlying said body portion, the top end of said armboard flap being integral with the bottom end of said crossarm portion, said armboard flap being substantially free of attachment to said body portion.

3,856,007

EAR PROTECTOR ASSEMBLY

Howard S. Leight, 16027 Northfield St., Pacific Palisades, Calif. 90272

Filed Apr. 2, 1973, Ser. No. 346,746
Int. Cl. A61f *11/00*
U.S. Cl. 128—152 3 Claims



3. An ear protector for mounting on an eyeglass frame that has temple bars comprising:

a mount having a mount wall forming a slot for slideably receiving a temple bar, a fastener mounted on said mount wall and moveable towards and away from the slot to clamp the mount wall at a chosen position along a temple bar, and a pair of bearing walls mounted on said mount wall and resiliently moveable together and apart and forming a socket;

an arm having first and second ends, said first end having a ball portion which is received between said bearing walls of said mount and which holds the pair of bearing walls biased apart to provide friction that retains the arm in any position to which it is pivoted; and

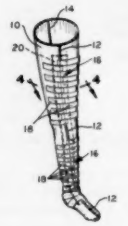
an earplug mounted at said second end of said arm.

3,856,008

ELASTIC GARMENT FOR IMPOSING PRESSURE ON UNDERLYING BODY REGIONS

Susan M. Fowler, Grand Rapids; Carolyn Jobst Gottfried, Rossford; Dennis G. Mosiniak, and Ansis U. Tenteris, both of Toledo, all of Ohio, assignors to Jobst Institute, Inc., Toledo, Ohio

Continuation of Ser. No. 99,214, Dec. 16, 1970, abandoned. This application May 24, 1973, Ser. No. 363,400
Int. Cl. A61f *13/00*
U.S. Cl. 128—165 6 Claims



1. A leg stocking comprising a main body portion including thigh, knee, calf, ankle, instep and foot portions of generally tubular shape and of flexible material which is longitudinally and circumferentially elastic having a front seam circumferentially closed at the top, knee, instep and foot, the remaining portions of said front seam being openings; a plurality of adjustable fastening means extending laterally across said openings and spaced along the length of said main body portion, whereby regions intermediate said spaced fastening means afford longitudinal elasticity to said garment along the margins of said openings; said main body portion at the knee, instep and foot portions being formed to impose a pressure gradient on the body regions to which it is applied by gradiations in the ratio of the circumference of the body region to the circumference of the garment region in registry therewith, whereby said closed tubular length imposes an inward directed radial pressure on the body region which is greater at one end thereof than at the other end, and being tailored to relieve pressure on the portion of the body encased thereby, whereby the pressure relief is accomplished by a smooth transition with said fastening means adjustable to give a gradual change in pressure gradient from the openings in said main body portion to the knee, instep and foot portions; said fastening means including lateral extensions of said material extending from both sides of the openings with said extensions on one side interdigitating with said extensions on the other side; a liner between the margins of said openings and said leg; pressure indicating indices for said extensions; and a second seam to facilitate tailoring that portion of said main body portion requiring a substantial change in contour to conform to the leg.

3,856,009

CATHETER PLACEMENT UNIT

Alon P. Winnie, Wilmette, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Division of Ser. No. 202,256, Nov. 26, 1971, Pat. No. 3,782,381. This application May 29, 1973, Ser. No. 364,798
Int. Cl. A61m *25/00*
U.S. Cl. 128—214.4 2 Claims

1. A catheter assembly comprising: a length of flexible tubing precurved at its distal end; an introducer needle having

a point at its distal end removably disposed within said tubing; and anti-skiving means mounted over said tubing and movable from a position overlying a portion of said tubing that is not

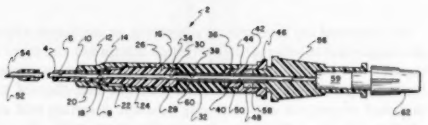
precurved to a position overlying said precurved distal end so that said distal end may be temporarily straightened to prevent internal skiving of said tubing when said introducer needle is fully positioned within said tubing.

3,856,010

CATHETER PLACEMENT UNIT WITH PRESSURE CLOSURE

Harvey Robert Moorehead, Salt Lake City, and George R. Reading, Sandy, both of Utah, assignors to Deseret Pharmaceutical Company, Inc., Sandy, Utah

Division of Ser. No. 170,157, Aug. 9, 1971, Pat. No. 3,811,440. This application Sept. 7, 1973, Ser. No. 395,120
Int. Cl. A61m *5/00*
U.S. Cl. 128—214.4 **3 Claims**



1. A stylet catheter assembly comprising:
a flexible catheter tube having an axial bore;
elongated piercing means coaxially disposed within the bore and extending beyond the length of the catheter tube in the initial assembled condition;
a hollow body affixed to the proximal end of the catheter tube through which the piercing means also coaxially passes in the initial assembled condition, the hollow of the body being in fluid communication with the bore of the catheter tube upon axial removal of the piercing means and the proximal end of the hollow body comprising an infusion female fitting;
the hollow body comprising a yieldable occluding hollow section with memory forward of the female fitting which upon being manually squeezed against the piercing means fully transversely collapses upon itself and thereby occludes the hollow of the body under said squeezing force immediately upon said axial removal of the piercing means from the catheter tube and from the occluding hollow section, to prevent blood loss after venipuncture following piercing means removal before infusion attachment at the female fitting.--

---

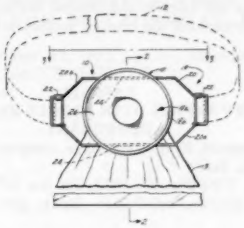
3,856,011

POST-SURGICAL DRAINAGE POUCH RETAINING ASSEMBLY

Burton L. Blanchard, 2216 Chevy Oaks Cir., Glendale, Calif. 91206

Filed Mar. 15, 1973, Ser. No. 341,388
Int. Cl. A61f *5/44*
U.S. Cl. 128—283 **12 Claims**

9. A post-surgical drainage pouch retaining assembly usable with a strap for holding a drainage pouch about an abdominal drainage opening of a person's body, comprising:
a retaining ring for coupling such pouch about such drainage opening and comprising a body facing side about the axis of the retaining ring for receiving a body-to-ring sealing ring;
a connector for coupling said retaining ring with such pouch to such strap about a person's body comprising
a. first and second springs mounted in said ring and extending in opposite directions away from the axis of said retaining ring to two spring extremities,



b. each said spring having a portion located at its extremity for coupling to such strap; and
c. the extensions of each said spring being resilient for spring loading said retaining ring in an axial direction toward such person's body and against such strap.

3,856,012

STABILIZED ABSORBENT PAD

Richard C. MacDonald, Rexdale, and Noel E. Martin, Weston, Ontario, both of Canada, assignors to Canadian International Paper Company, Montreal, Quebec, Canada

Filed Dec. 8, 1972, Ser. No. 313,596
Int. Cl. A61f *13/18*
U.S. Cl. 128—284 **3 Claims**

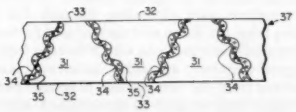
1. A stabilized absorbent pad comprising a quantity of wood fibers defining said pad,
a plurality of filaments spaced apart from each other and extending from portion to portion of said pad,
water soluble adhesive interposed between each of said filaments and adjacent fibers, said adhesive and filaments defining a bond network wherein the tenacity of adhesion of said fibers to a filament decreases as a function of their proximity to said filament and wherein those fibers in one portion of said pad that are adhesively connected to a particular filament are further connected through said filament to such other portions of said pad to which said filament extends thereby stabilizing said pad against migration of said fibers within said pad.

3,856,013

HOLLOW FOAM TAMPONS FROM FLAT BLANKS

Bernard A. Dulle, Montgomery, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 172,790, Aug. 18, 1971, abandoned. This application Apr. 20, 1973, Ser. No. 353,058
Int. Cl. A61f *13/20*
U.S. Cl. 128—285 **9 Claims**



1. A tampon comprising: a flexible, resilient, elastic, absorbent body, said body being a cellular material having a dry modulus of compressibility of from 0.2 p.s.i. to 0.6 p.s.i., said body having an internal discontinuity forming an interior

surface, said material having been deformed subsequent to cell formation so as to provide the interior surface of said body with a circumferential compressive stress and the exterior surface of said body with a circumferential tensile stress so that the exterior surface portion is tensilely strained and the interior surface portion is compressively strained and the cell diameters parallel to and at said exterior surface are thereby made generally larger than the cell diameters parallel to and at said interior surface, thereby establishing a capillary gradient between the exterior and interior surfaces which creates a driving force from the exterior surface toward the interior surface.

3,856,014

SANITARY NAPKIN WITH POROUS RESIN POWDER DEODORANT

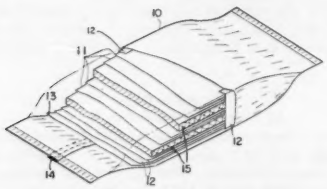
Akira Yamauchi, Hyogo-ken, Japan, assignor to Jex Co., Ltd., Osaka-fu, Japan

Filed Dec. 22, 1972, Ser. No. 317,795

Claims priority, application Japan, Oct. 23, 1972, 47-106072

Int. Cl. A61f *13/16*

U.S. Cl. 128—290 **15 Claims**



1. In a sanitary napkin which comprises at least one layer of staple fibers in the form of a pad, the improvement wherein said pad contains as a deodorant a porous resin powder which is the condensation product of an aromatic amine with formaldehyde in the form of its acid salt.

3,856,015

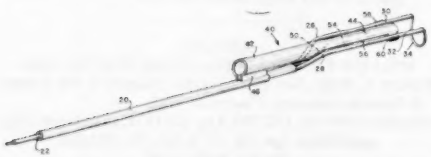
STABILIZED CUTTING LOOP FOR RESECTOSCOPE

Jose J. Iglesias, 1341 North Ave., Elizabeth, N.J. 07205

Continuation-in-part of Ser. No. 219,687, Jan. 21, 1972,. This application June 8, 1973, Ser. No. 368,185

Int. Cl. A61b *17/32*

U.S. Cl. 128—303.15 **2 Claims**



1. As a new article of manufacture, a cutting loop assembly for a resectoscope used for performing transurethral operations, comprising an elongated conduit, an insulated electrically conductive wire extending through the conduit and protruding from the distal end thereof and formed into a wire loop comprising first sections which diverge from the conduit and extgend angularly upwardly therefrom, second sections which extend from the first sections in spaced parallel relation to each other and parallel to the conduit, and a depending un-insulated loop connecting the ends of the second sections of the wires, and means for reinforcing and stabilizing the wire loop comprising an elongated rigid member formed of sheet material having a tubular part at its proximate end which is rigidly connected to the distal end part of the conduit above the conduit and extends longitudinally thereof and outwardly therefrom, and a part distal to the tubular part which is part circular in cross section and forms an extension of the upper part of the tubular part and has lower edges which are parallel to adjacent, and in a plane even with or above the first and the second sections of the wire loop, and means rigidly connecting the part circular part of the elongated rigid member to the second sections of the wire loop at a part thereof adjacent the depending loop.

3,856,016

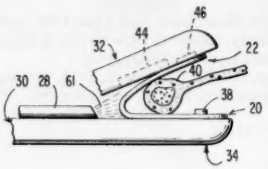
METHOD FOR MECHANICALLY APPLYING AN OCCLUSION CLIP TO AN ANATOMICAL TUBULAR STRUCTURE

Hugh J. Davis, 2 E. Highfield Rd., Baltimore, Md. 21218

Filed Nov. 3, 1972, Ser. No. 303,314

Int. Cl. A61b *17/12, 17/10;* **B21d** *5/16*

U.S. Cl. 128—325 **5 Claims**



1. A method for mechanically applying an occlusion clip to an anatomical tubular structure which comprises the steps of securely mounting an occlusion clip onto a tubular instrument having clip-receiving jaws located near one end thereof and disposed in an open clip-receiving position, inserting said end of the tubular instrument having the jaws with the clip mounted thereon through an opening in an anatomical body and while viewing through an optical viewing means disposed near the other end of said tubular instrument and provided with illumination for illuminating the area of the jaws and the areas distally thereof, positioning the open jaws and the clip mounted thereon in a proper position over the anatomical tubular structure and thereafter closing the clip to produce an occlusion in said anatomical structure.

3,856,017

APPARATUS FOR LIGATING SECTIONED BLOOD VESSELS

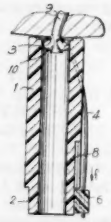
Pierre Perisse; Jean Maurice Francois Perisse, both of 8 Rue du Stade 31, Rieumes, France (31370), and Andre Robert Chancholle, 20 Avenue Frizac, Toulouse, France (31400)

Filed Feb. 26, 1973, Ser. No. 335,758

Claims priority, application France, Feb. 24, 1972, 72.6328; Apr. 28, 1972, 72.15401

Int. Cl. A61b *17/12*

U.S. Cl. 128—326 **7 Claims**



1. An apparatus for ligating sectioned blood vessels comprising a cylindrical body including means for removably attaching the body to a suction source, said cylindrical body

having an open end which can be placed against the end of a sectioned vessel and the tissue region therearound to form a tissue bud thereof within said body under the suction pressure from said suction source, means on said body for supporting a closure member adapted to ligate said vessel, said means supporting said closure member in surrounding relation to said bud, and actuator means operated externally of said body for applying said closure member around said bud in the course of application of suction pressure thereto to contract the tissue bud and close said end of the sectioned vessel.

3,856,018

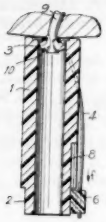
PROCESS FOR LIGATING SECTIONED BLOOD VESSELS

Pierre Perisse; Jean Maurice Francois Perisse, both of 8 Rue du Stade 31, Rieumes, France (31370), and Andre Robert Chancholle, 20, Avenue Frizac, Toulouse, France (31400)

Division of Ser. No. 335,758, Feb. 26, 1973. This application June 7, 1974, Ser. No. 477,269

Int. Cl. A61b *17/12*

U.S. Cl. 128—326 **3 Claims**



1. A process for ligating sectioned blood vessels comprising applying suction force to the end of a sectioned vessel, as well as the tissue zone surrounding it to effect simultaneously the elimination of blood and the formation of a tissue bud containing the end of the vessel, and contracting the tissue bud at the base thereof, while still applying the suction to close said vessel end.

3,856,019

ACUPUNCTURE NEEDLE

Bruce E. Waller, 533 Pali Dr., Long Beach, Calif. 90805

Filed June 4, 1973, Ser. No. 366,474

Int. Cl. A61b *17/34*

U.S. Cl. 128—329 A **6 Claims**

1. An acupuncture needle comprising an elongated, wire-like shaft of rigid material and of uniform cross-section, one end of said shaft having a hollow ground point, said shaft including first and second elements thereon adjacent the end of said shaft distal said point, said elements being longitudinally spaced apart and defining therebetween a shaft portion, the distance between said elements being dimensioned such that said shaft portion and said elements may be simultaneously grasped and manipulated by the fingers of one hand.

3,856,020

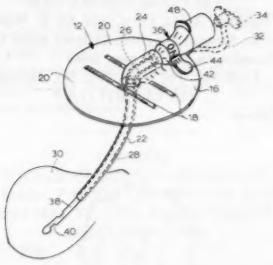
TROCAR-CATHETER ASSEMBLY

Stephen Robert Kovac, No. 3 Brookside Ln., Ladue, Mo. 63124

Filed Sept. 17, 1973, Ser. No. 397,520

Int. Cl. A61m *25/02, 5/14*

U.S. Cl. 128—347 **5 Claims**



1. A trocar catheter for use in penetrating body cavities including: a one-piece catheter device including a flexible plate element, a catheter tube extending from one side of the flexible plate element and a curved flexible elbow section extending from the other side of the flexible plate element and having a through bore which communicates with the through bore of said catheter tube, means to permit the through bores of said catheter tube and flexible curved elbow section to be held and aligned including having a curved elbow section flexibly mounted on a portion of said plate element of said catheter device, and a rigid trocar slidably and removably received within the curved elbow section and catheter tube to align the communicating through bores thereof.

3,856,021

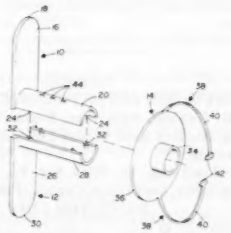
DEVICE FOR TREATMENT OF BLOAT OF RUMINANTS

Arthur J. McIntosh, La Porte City, Iowa 50651

Filed Oct. 1, 1973, Ser. No. 402,191

Int. Cl. A61b *17/34;* **A61m** *27/00*

U.S. Cl. 128—347 **12 Claims**



1. A device for the treatment of bloat in ruminants including a means for providing a removable passageway through the tissues of the ruminant leading into its rumen, said device comprising a first component having a first member forming a longitudinal trough-like portion of a passageway open at its ends and a second member extending from said first member

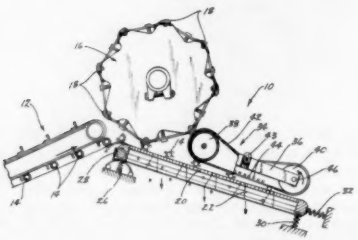
substantially at a right angle outwardly and away from said passageway, a second component separably connected to said first component and also having a first member forming a longitudinal trough-like portion of said passageway and a second member extending substantially at a right angle from said first member outwardly and away from said passageway, the first members of said first and second components defining a means for forming a tubular passageway when said trough-like portions are assembled in connected relationship, and means for maintaining said components in fixed assembled relationship to each other and in sealing contact with said tissues, said means also providing for separation of said components when the device is disassembled.

3,856,022

SHELLING MECHANISM

Wesley F. Buchele, Ames, Ohio, and Ali R. Mahmoud, Khartoum North, Sudan, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed July 26, 1973, Ser. No. 382,668
Int. Cl. A01f *11/06*
U.S. Cl. 130—6 **6 Claims**



1. A corn shelling mechanism comprising,

an elongated concave means having first and second ends,

a powered rotatable cylinder means positioned above said concave means adjacent said first end for partially shelling the ears passing therebetween,

means for conveying the ears to said cylinder means,

a powered belt sheller positioned above said concave means in a spaced relationship with respect thereto, said belt sheller extending from said cylinder means towards said second end, said belt sheller urging the partially shelled ears to engagement with said concave means to complete the shelling operation, said concave means being straight and continuous beneath said cylinder means and said belt sheller.

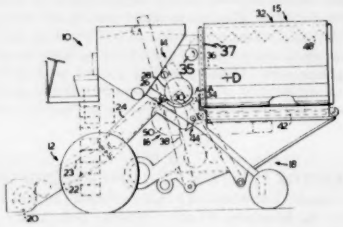
3,856,023

DRUM FOR ROTARY DECK THRESHER

Bernard G. Habicht, Saskatoon, Saskatchewan, Canada, assignor to Western Roto Thresh Ltd., Saskatoon, Saskatchewan, Canada

Filed Aug. 14, 1972, Ser. No. 280,244
Claims priority, application Canada, June 14, 1972, 144686
Int. Cl. A01f *12/44*
U.S. Cl. 130—27 Q **8 Claims**

1. A rotary deck apparatus for threshing machines for separating granular material from straw after threshing, comprising: a substantially horizontally oriented open-ended tube-like rotary deck, said deck having an entrance end and an exit end for granular material and straw; said deck being perforated to the extent of 30 – 90 percent of its surface, means for rotating said deck at a speed to produce a peripheral centrifugal force between 0.7 to 1.7 times the value of gravity; and a curved deflector separate from said rotary deck but fixed at a location within the entrance end thereof for deflecting a stream of



mixed straw and grain downward onto the interior surface of the rotary deck at the entrance end thereof.

3,856,024

RIGID REAMER TYPE SMOKING PIPE CLEANER

John J. Lamberti, Hotel Breslin Broadway 29th, New York, N.Y. 10001

Continuation-in-part of Ser. Nos. 152,190, June 11, 1971, abandoned, and Ser. No. 215,830, Jan. 6, 1972, abandoned.
This application May 16, 1973, Ser. No. 360,755
Int. Cl. A24f *09/04*
U.S. Cl. 131—243 **7 Claims**

1. A rigid reamer-type smoking pipe cleaner comprising two substantially rigid spring metal wires of round section twisted slightly loosely upon one another along an imaginary common linear axis, said twisted wires having a forward reaming portion with sharpened reaming and cutting end edges, respectively provided on the respective wire ends and adjacent to one another, said cleaner being usable by extending the forward reaming portion into a tar caked smoke passage of a smoking pipe bowl stem or mouthpiece and turning the cleaner to cut into pieces the caked tar and gum on the wall surfaces of the smoke passages, the twisted wires being wound over one another to provide spiral-shaped valleys or channels running coextensively with the common linear axis to accommodate the cut caked tar pieces and gum and permit their travel rearwardly from the point of reaming of the caked tar along the smoke passages, said twisted spring metal wires being adapted to laterally expand at their cutting edges when the cleaner is turned into the passages in the direction of twist of the wires upon the reamer portion thereby to cause the cutting edges to span the full internal diameter of the smoke passage up to the wall surface of the passage so that a full clearing of the passages will be effected and a handle end provided at the rear of the cleaner for turning the cleaner into the caked passage, said handle end being formed of the twisted wires spaced from one another and folded in a com-

mon plane to provide a pocket clip formation upon the cleaner.

3,856,025
TOBACCO FILTERS

Wasuke Sato; Seijiro Yamamoto, both of Tokyo; Nobuaki Kuwabara, and Shigeru Adachi, both of Yokohama, all of Japan, assignors to Showa Denko K.K., Tokyo, Japan

Filed Mar. 21, 1973, Ser. No. 343,421
Claims priority, application Japan, Mar. 23, 1972, 47-28579
Int. Cl. A24b *15/02*
U.S. Cl. 131—264 **12 Claims**

1. Tobacco smoke filters adapted for use with a tobacco smoke article and of a shape to be inserted in the smoke passage of such tobacco smoke article which comprises a mixture of 80 to 20 parts by weight of copolymer material and 20 to 80 parts by weight of polyolefin material, said copolymer material consisting of ethylene-vinyl acetate copolymer containing 10 to 80 mol % of ethylene, which copolymer has been saponified to an extent of at least 85 percent and said polyolefin material is selected from the group consisting of polypropylene and polyethylene, said copolymer material and said polyolefin material being in the form of fibers, split fibers, films or moldings.

3,856,026
APPLICATION OF FLOCK TO THE BODY FOR COSMETIC PURPOSES

Donald M. Gaydos, 3218 Friar Dr., Parma, Ohio 44134

Filed Jan. 16, 1974, Ser. No. 433,685
Int. Cl. A45d *29/00*
U.S. Cl. 132—73 **10 Claims**

1. A method of applying flock to a portion of a human body, which comprises applying the flock to a substance which adheres to said portion of the body.

3,856,027
HAIR GROOMING AID

Allan E. Legere, Swampscott, Mass., assignor to Cesari and McKenna, Boston, Mass.

Filed May 29, 1973, Ser. No. 364,694
Int. Cl. A45d *24/00*
U.S. Cl. 132—148 **4 Claims**

1. A hair grooming aid comprising

A. a generally continuous elongated housing having
   1. a portion of enlarged, generally cylindrical cross section for accomodating a generally cylindrical aerosol cannister therein, joined to
   2. a portion of diminished cross section for accomodating an elongated comb therein with its spine parallel to the axis of said cannister and in side-by-side relation thereto,
   3. an aperture extending from said portion of diminished cross section to the exterior of said housing for passage of said comb therethrough,
   4. parallel tracks aligned with said aperture for positioning a comb therebetween and guiding it through said aperture for use exterior to said housing and for storage interior thereto,

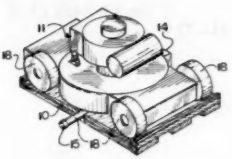
B. a generally cylindrical aerosal cannister
   1. positioned within said enlarged portion
   2. having a spray nozzle thereon actuable to release a spray from said cannister.

C. an elongated comb
   1. positioned within said reduced portion
   2. slidable in said tracks through said aperture for use exterior to said housing.

3,856,028
MOWER CLEANING APPARATUS

Gordon W. Kehler, P.O. Box 169, Fallbrook, Calif. 92028

Filed Mar. 12, 1973, Ser. No. 340,598
Int. Cl. B08b *3/00*
U.S. Cl. 134—198 **6 Claims**



1. A rotary lawn mower cleaning device comprising a generally elongated body adapted to rest on a lawn;
   said body including a platform of sufficient size to support a rotary lawn mower thereon and including an entrance portion to said platform and an exit portion at the opposite end thereof;
   said platform including a surface engaging the wheels of a lawn mower on the platform to resist its rolling movement thereon;
   said body including at least one side wall extending along said platform of height greater than said entrance and exit portions of said platform;
   water discharge means supported in a central portion of said platform;
   said water discharge means generally including a plurality of discharge openings directed upward from said platform; and
   means extending through said side wall for connecting said water discharge means to a water supply.

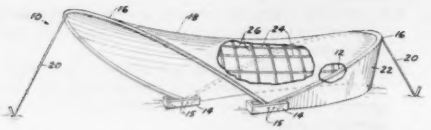
3,856,029
DAMPING MEANS FOR PORTABLE STRUCTURES

Carl F. Huddle, Pleasant Ridge, Mich., assignor to Tension Structures Co., Royal Oak, Mich.

Filed July 6, 1970, Ser. No. 52,619
Int. Cl. E04b *1/347*
U.S. Cl. 135—1 R **10 Claims**

1. A portable, semi-rigid architectural structure comprising a plurality of arches with formed bight sections, said arches being inclined from a common support and tilted outward

from each other, a first plurality of longitudinal support members attached between said arches, a second plurality of transverse restraining members operatively connected to said longitudinal support members for holding said longitudinal support members in position, at least one of said first and second pluralities of members varying in length and being unevenly



spaced, a membrane operatively connected to said support members and spanning said arches, said membrane forming a tensioned warped roof for the structure, said members and membrane cooperating to effectuate a de-tuned roof system, and means for anchoring said arches to said common support for maintaining said longitudinal support members and said membrane in tension.

3,856,030

AUTOMATICALLY OPENABLE AND CLOSABLE UMBRELLA

Yoshio Sato, Nagareyama, Japan, assignor to Kabushiki Kaisha Ideal, Tokyo, Japan

Filed Mar. 5, 1973, Ser. No. 338,261

Claims priority, application Japan, May 19, 1972, 47-049756

Int. Cl. A45b *25/16*

U.S. Cl. 135—22 **4 Claims**

1. An automatically openable and closable umbrella comprising a shaft having a tubular outer shaft member slidably housing therein an upper inner, an intermediate inner and a lower inner tubular shaft members;

a first ring fixed to the upper portion of said upper shaft member and pivotably carrying a plurality of ribs;

a plurality of extensible rods;

a second ring mounted on said shaft below said first ring, said second ring being fixed to said outer shaft member and pivotably carrying said extensible rods pivotably supporting said ribs;

a plurality of supporting rods;

a third ring mounted on said shaft below said second ring and pivotably carrying said supporting rods pivotably supporting said extensible rods;

a plurality of spokes;

a fourth ring mounted on said shaft below said third ring and pivotably carrying at a site other than the pivotal point of each of said extensible rods, said spokes pivotably supporting said ribs;

compressible first spring menas for opening the umbrella and provided between said intermediate and said lower shaft members to urge them apart;

a washer ring;

compressible second spring means for opening the umbrella, said second spring means being mounted on said shaft between said third ring and said washer ring, said washer ring being securely attached to said intermediate shaft member so as to slide on said outer shaft member, said second ring menas being capable of urging said upper and intermediate shaft members apart with respect to said outer and lower shaft members;

first latch means for opening the umbrella, said latch means being capable of disengageably engaging said fourth ring; and second latch means for closing the umbrella, said second latch means being provided in the lower portion of the lower shaft member and being capable of releasing the outer shaft member from its engagement with the lower shaft member,

characterized in that:

said spokes are constituted by pairs of elastic belt members, each pair being associated with a corresponding one of said ribs, wherein the elastic belt members belong to adjacent pairs are interconnected intermediate the span thereof, whereby, as the umbrella is opened, the ribs of each pair are elastically bowed laterally intermediate the span thereof to store force for aiding collapsing the umbrella;

said fourth ring including means housing said second latch means when the umbrella is closed, to prevent accidental finger-release of the second latch means.

3,856,031

TELESCOPIC UMBRELLA

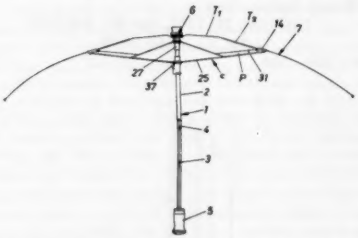
Heinz Weber, Hilden, Germany, assignor to Telesco Brophey Limited, Montreal, Quebec, Canada

Filed Apr. 9, 1973, Ser. No. 349,006

Claims priority, application Germany, Sept. 21, 1972, 2246237; Japan, Dec. 25, 1972, 47-4560; Canada, Oct. 30, 1972, 155213

Int. Cl. A45b *19/00*

U.S. Cl. 135—25 R **9 Claims**



1. An umbrella including an umbrella frame and a cover, a telescopic stick, a crown at one end of the stick, at least a main runner slidable on the stick, a stretcher member hinged to the runner, a strut member hinged to a point on the stick between the main runner and the crown, and to a point intermediate the stretcher member, a dome rib hinged near one end thereof to the end of the stretcher member, a link member hinged to a point on the strut at one end thereof, and at the inner end of the dome rib forming a quadrilateral linkage therewith, a pair of members foldable in a direction outwardly from the stick hinged to the crown and to the inner end of the dome rib,

a cover attached to the crown and to the dome ribs, such that when the umbrella is being closed to its collapsed position, the foldable members will fold outwardly causing the umbrella cover in the area of the foldable members to spread outwardly forming a mushroom.

3,856,032

UMBRELLA RUNNER

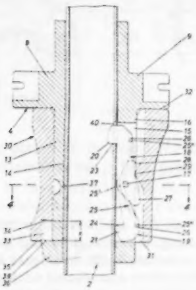
Josef Schafer, Solingen, Germany, assignor to Telesco Brophey Limited, Montreal, Quebec, Canada

Filed May 14, 1973, Ser. No. 359,843

Claims priority, application Germany, May 31, 1972, 2226384

Int. Cl. A45b *25/06*

U.S. Cl. 135—28 **3 Claims**



1. A runner slidable on an umbrella stick comprising an axially-extending sleeve having an inner surface in sliding contact with the stick, a recess in the sleeve, a hinge pin traversing the recess at right angles to the axis of the stick, but in a plane parallel to the axis of the stick, locking means hinged to the pin, wherein the locking means includes two separate locking pawls one on either side of the pin, each having an engaging head on a shank pivoted to the hinge pin and a cam member extending on the opposite side of the pin and adapted to be engaged by activating means; said activating means including a coaxial slide member adapted for limited sliding movement on the sleeve of the runner and having an inwardly extending projection adapted to engage alternately the locking pawls for relative movement with the respective apertures in the stick.

3,856,033

DYNAMIC GAS BLENDING

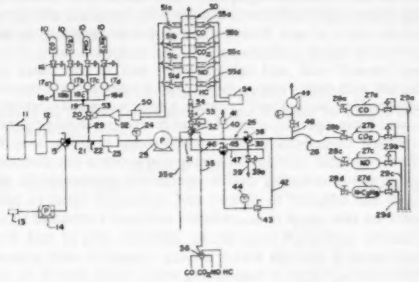
Donny R. Strain, Waterford, and Daniel B. Martin, Troy, both of Mich., assignors to Scott Environmental Technology, Inc., Plumsteadville, Pa.

Filed Feb. 22, 1973, Ser. No. 334,842

Int. Cl. G05d *11/08*

U.S. Cl. 137—3 **8 Claims**

1. A method of charging a partly filled pressurized storage vessel with a thoroughly mixed blend of gases, the concentrations of which match the blend which is already in the vessel, wherein the charging pressure is a pressure at which the gaseous components of the blend do not freely intermix which method comprises measuring the concentration of the components of the blend in the pressurized vessel, feeding the components of the blend from separate sources to a low pressure mixing zone, mixing the components of the blend in the mixing zone at a pressure at which the components of the blend freely intermix, compressing the mixture and filling the vessel with the compressed mixture, monitoring the concentration of the components of the compressed mixture and adjusting the feed to the low pressure mixing zone in a sense to compensate for departures of the concentrations of the mixture from the



mixture previously in the vessel to thereby match the mixture previously in the vessel.

3,856,034

FLOW CONTROL VALVE

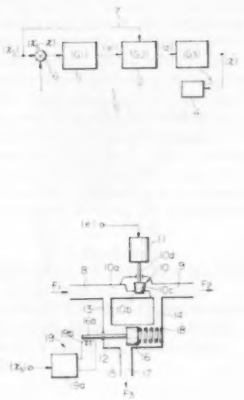
Takane Itoh, Yokohama, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed June 20, 1973, Ser. No. 371,664

Claims priority, application Japan, June 21, 1972, 47-62113

Int. Cl. F15b *11/02;* **G05b** *11/38;* **G05d** *7/06*

U.S. Cl. 137—117 **4 Claims**



1. In a control system for fluid operated equipment having an error signal generator for providing an error signal by comparing a command signal representing a desirable value signal with an actual value signal of a controllable variable, and having a controller for adjusting and amplifying said error signal to provide an amplified error signal; a flow control valve for controlling fluid flow therethrough in accordance with said amplified error signal, said fluid-operated equipment being operated by fluid discharged from said flow control valve at a controlled flow rate, a detecting device for detecting the actual value of said controllable variable and transmitting said actual value signal back to said comparator, said flow control valve comprising means for controlling fluid flow by adjusting a valve opening in accordance with said amplified error signal and means for controlling a pressure difference between the upstream and downstream sides of said flow control valve in accordance with said command signal, said means for control-

ling fluid flow including an inlet conduit for receiving pressurized fluid flow therein and an outlet conduit connnected to said inlet conduit for discharging fluid at a controlled flow rate to said fluid-operated equipment, and said means for controlling the pressure difference between the upstream and downstream sides of said flow control valve in response to said command signal including a cylinder communicating at one end thereof with said inlet conduit and at the other end thereof with said outlet conduit, and having a drain opening provided in a wall of said cylinder, a return conduit connected to said drain opening, a spool slidably inserted in said cylinder to adjust the effective area of said drain opening, a spring disposed in said cylinder for urging said spool in one direction, and a spool actuating device operatively connected to said spool and adapted to receive said command signal to apply force on said spool in accordance with said command signal, whereby said spool controls the effective area of said drain opening at a position where a force caused by said pressure difference, a force of said spring and a force caused by said command signal are balanced.

3,856,035

LIQUID LEVEL CONTROL VALVE

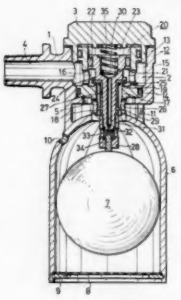
Katsuji Fujiwara, 191, Nishitani, Hiraoka-cho, Kakogawa-shi, Hyogo-ken, Japan

Filed Nov. 19, 1973, Ser. No. 416,788

Claims priority, application Japan, Dec. 20, 1972, 47-146484

Int. Cl. F16k *31/22*

U.S. Cl. 137—413 **7 Claims**



1. A liquid control valve comprising, in combination, a housing, defining a valve chamber with a side wall and a bottom wall; an inflow port communicating with said valve chamber at a lower portion of said side wall; an annular seat provided at said bottom wall defining an outflow port; a float retaining member positioned beneath said outflow port; a float retained within said float retaining member in a freely movable state; a sealing member consisting of a piston disposed within said valve chamber and arranged displaceably in an air-tight sealing engagement along said wall of said valve chamber at its upper portion, thereby forming a pressure chamber; a sealing element mounted on said piston over said annular seat for cooperation therewith; a slender rod projecting from said piston into said float retaining member through said outflow port; a first orifice provided in said sealing member interconnecting said pressure chamber with said outflow port, and a second orifice positioned at the lower end of said slender rod over said float and leading therefrom to said pressure chamber through a passage; said first orifice having a smaller cross-sectional area than said second orifice.

3,856,036

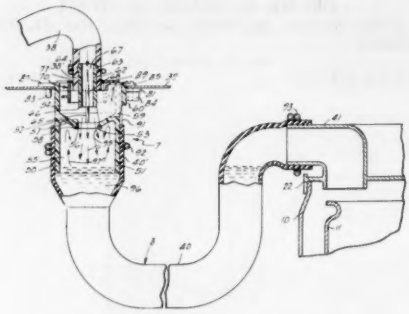
SIPHON BREAK AND DIVERTER FOR AN APPLIANCE

Reinhold Alvin Drews, Stevensville; Alexander B. Rosinski, Jr., Saint Joseph, and Joseph August Gauer, Buchanan, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 2, 1973, Ser. No. 412,116

Int. Cl. F16k *45/00*; **F16l** *55/06*

U.S. Cl. 137—216.1 **20 Claims**



1. A siphon break for use in a water inlet system for an appliance comprising a housing having a continuous wall forming a cavity, a center baffle having an aperture disposed in said cavity to form first and second cavity portions in communication with each other through said aperture, said wall having at least one opening therein adjacent to said baffle and communicating to said first cavity portion, water inlet means including a water fitting adapted for connection to a water supply conduit, said fitting having a passage therethrough, means for positioning said fitting in said first cavity portion in both a spaced relationship with said wall and with an end of said fitting being spaced from the baffle and in alignment with said aperture, said housing adjacent the second cavity portion having means adapted for connection to an outlet hose; and a cap surrounding said fitting and being received in a space between the fitting and wall, said cap having at least two rows of individually, spaced baffles with the baffles of one row being arranged over the spaces between the baffles of the other row to form a labyrinth path therebetween so that water splashing in the first cavity portion is prevented from splashing out of the siphon break.

3,856,037

VALVE SEQUENCE INTERLOCK SYSTEM

Michael R. Garrett; Samuel W. Putch, and Norman A. Nelson, all of Houston, Tex., assignors to FMC Corporation, San Jose, Calif.

Filed Jan. 22, 1973, Ser. No. 325,490

Int. Cl. E21b *7/12*; **F17d** *17/00*

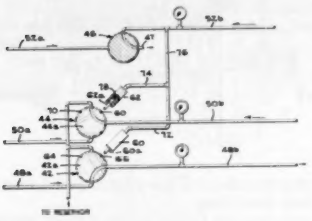
U.S. Cl. 137—236 **15 Claims**

1. A fluid flow control system for a well flow conduit, comprising:

1. a plurality of fluid-actuated valves installed in series relationship in a well flow conduit,
2. a fluid pressure conduit system interconnecting each of said valves and a fluid pressure source for actuation of said valves,
3. a plurality of fluid pressure control valves positioned in said fluid pressure conduit system for respective individual regulation of the admission of fluid pressure from said source to said fluid-actuated valves, and
4. an interlock system for assuring the operation of said fluid-actuated valves in a predetermined sequence, said interlock system including:

a. restricting means actuatable to prevent operation of at least a certain one of said plurality of control valves, and

b. control means for said restricting means, said control means comprising fluid conduit means interconnecting said restricting means and said fluid pressure conduit system so that said certain control valve restricting means is operated by valve-actuating fluid pressure in said fluid conduit means when a selected remaining one of said control valves is in a predetermined first condition to actuate its said fluid-actuated valve and said



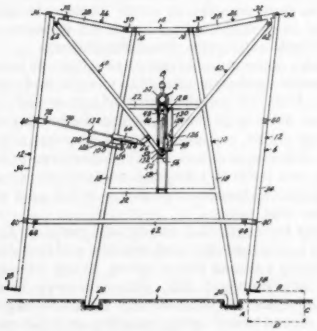
restricting means is rendered inoperative when said selected control valve is in a predetermined second condition to de-actuate its said fluid-actuated valve, whereby placing said selected control valve in said first condition results in opening its said fluid-actuated valve and operating said restricting means to prevent operation of said certain control valve and associated fluid-actuated valve, and placing said selected control valve in said second condition results in closing its fluid-actuated valve and rendering said restricting means inoperative to facilitate operation of said certain control valve and fluid-actuated valve.

3,856,038

IRRIGATION PIPE WALKER

George T. Paul, 2521 Wisconsin, Joplin, Mo. 64801

Filed Nov. 5, 1973, Ser. No. 412,882
Int. Cl. A01g *25/02*; **B05b** *3/12*
U.S. Cl. 137—344 **10 Claims**



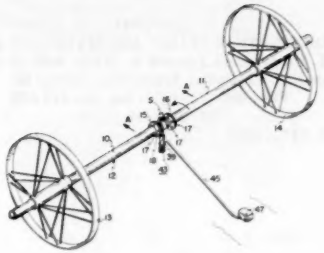
1. A tower for supporting an irrigation pipe extending horizontally above ground level, said pipe being adapted to be secured to said tower and said tower having two sets of ground engaging feet, the feet of one set being movable relative to the feet of the other set, both vertically so that either set may be disposed higher than the other, and also horizontally in a direction transverse to said irrigation pipe, and operating means carried by said tower and operable to move one of said sets of feet relatively to the other set in a cyclically repetitive series of strokes consisting successively of an upward stroke, a horizontal stroke in one direction, a downward stroke, and a horizontal stroke in a direction opposite to said first horizontal stroke, whereby said tower is caused to walk in a direction transverse to the irrigation pipe, and whereby all of said feet move essentially only in a vertical direction as they engage and disengage the ground.

3,856,039

AGRICULTURAL WHEEL-LINES

Burr Courtright, Le Grande, Oreg., assignor to CH$_2$O, Inc., LeGrande, Oreg.

Filed Nov. 7, 1973, Ser. No. 413,703
Int. Cl. B05b *15/02*
U.S. Cl. 137—344 **14 Claims**



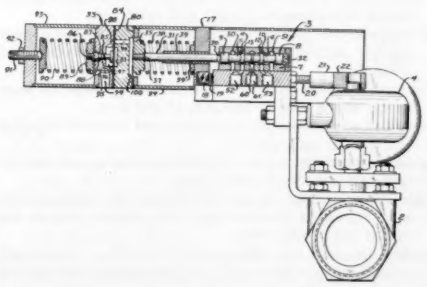
1. An agricultural irrigation wheel-line including, in combination, a pair of horizontally spaced wheels; wheel-line conduit means, mounting said wheels, for conducting water to a water delivery system essentially upstanding from said wheel-line conduit means; an outer sleeve member; plural, mutually spaced seal means for rotatably sealing said outer sleeve member to and about said wheel-line conduit, said wheel-line conduit including aperture means for conducting water from within said wheel-line conduit to and within said outer sleeve member, between said seal means; water delivery structure mounted to and upstanding from said outer sleeve member; and trail weight structure comprising a rearwardly declining leg articulatively coupled to said outer sleeve member.

3,856,040

ANALOG POSITION CONTROLLER HAVING TWO STAGE VALVE CONTROL

Eugene A. Roeske, 9S125 Lake Dr., Clarendon Hills, Ill. 60514

Filed Apr. 6, 1973, Ser. No. 348,642
Int. Cl. F16k *31/12*; **G05d** *16/06*
U.S. Cl. 137—488 **6 Claims**



1. An apparatus for controlling the operative position of a control means according to a sensed parameter comprising,

controller means for transmitting a control pressure signal in response to a change from a predetermined level of an input pressure signal representative of a parameter,

said controller means being operatively coupled to a control means regulating the parameter to vary the operative position thereof proportional to the control pressure,

said controller means including a first pressure responsive element adapted to sense the input pressure signal and a second pressure responsive element adapted to effect transmission of a pressure signal by the control means

valve means positioned between a source of pressure and the second element and operable to direct pressure to the second element,

said valve means directing a pressure signal to the second element at a reduced pressure directly proportional to the level of the input signal upon the input signal reaching a predetermined level.

3,856,041

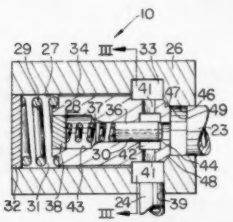
COMBINATION RELIEF AND MAKE-UP VALVE

John R. Cryder, and Edward A. Wirtz, both of Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 28, 1973, Ser. No. 419,625

Int. Cl. F16k *17/26*

U.S. Cl. 137—493.6 **6 Claims**



1. A combination relief and make-up valve assembly comprising:

a housing having a cylindrical bore formed therein;

a low pressure port communicating with said bore at one end thereof;

a first valve seat defined by the juncture of said port and said bore;

an annulus surrounding said bore and communicating therewith adjacent said valve seat;

a high pressure port communicating with said annulus;

a first poppet plunger reciprocally disposed in said bore and biased into engagement with said valve seat;

a stepped bore closed at one end formed in said first poppet plunger defining a second seat adjacent the open end thereof;

an annulus surrounding and communicating with said bore at the intersection of said step of said bore;

a second poppet plunger disposed in said bore and engaging said second valve seat;

passage means communicating said annulus in said plunger with said annulus in said housing;

said second poppet plunger including a bore communicating pressurized fluid in said low pressure port to the closed end of said bore;

spring means in said closed end of said bore biasing said second plunger into seated engagement with said second valve seat; and

said second plunger including an area in communication with said high pressure port and disposed to creat a force in response to said pressurized fluid in opposition to said spring means to thereby unseat said second plunger in response to a predetermined pressure.

3,856,042

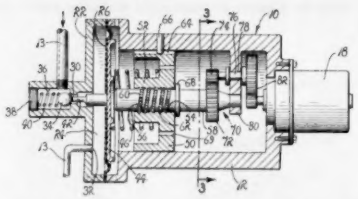
COMBINED PRESSURE REGULATOR AND SHUTOFF VALVE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention by, and Edgar F. Koch, Tujunga, Calif.

Filed June 21, 1973, Ser. No. 372,149

Int. Cl. F16k *17/04*

U.S. Cl. 137—505.42 **1 Claim**



1. A valve for achieving flow control over a stream of pressurized fluid comprising:

A. a valve housing having means defining therein a fluid inlet orifice, a fluid discharge orifice and a passage for pressurized fluids extended therebetween;

B. means defining within said passage a sealable port of cylindrical configuration;

C. a ball supported within said passage for incremental movement between a first position, wherein said ball is seated in said port in a sealing relationship therewith for interrupting a flow of pressurized fluid therethrough, and a second position, wherein said ball is disposed in spaced relation with the port for accommodating a flow of pressurized fluid therethrough;

D. means for continuously urging said ball in displacement toward said first position including a first helical spring seated within said passage in contiguous relation with said ball;

E. means for displacing said ball toward said second position including,

1. an axially movable pintle having one end extended axially through said port into abutting engagement with the ball, and

2. means supporting said pintle for axial motion relative to said port including an axially displaceable disk disposed in coaxial alignment with the opposite end of said pintle and rigidly affixed thereto; and

F. means for imparting axial motion to said pintle including,

1. a flexible diaphragm secured to said disk and extended radially from the periphery thereof into sealed relation with said housing for defining within the housing an hermetically sealed, expansible plenum chamber communicating with said port and said fluid discharge orifice for moving said pintle in a first direction relative to said port in response to increased pressures within said plenum chamber, and

2. means for continously urging said pintle in displacement in a second direction opposite said first direction including a second helical spring, having one end portion engaging said disk, extended away from said plenum chamber, reactive stop means for supporting said second helical spring including an axially movable block having a tubular bore extended axially therethrough in coaxial alignment with said port, means including a mounting post concentrically related to said bore for receiving the opposite end portion of said second helical spring in a concentric relationship, means for imparting axial motion to said movable block including means for supporting said block against rotary motion, a drive shaft supported for rotary motion and extended concentrically through said bore, a ball-and-groove coupling interconnecting said drive shaft and said block, including means defining opposed heli-

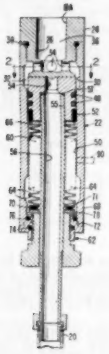
cal grooves extended along the adjacent surfaces of said drive shaft and said bore, a plurality of balls seated in said opposed grooves, drive means including a reversible stepper motor, and a gear train connecting said stepper motor with said drive shaft for imparting rotary motion to the drive shaft, whereby axial motion is imparted to said block for axially displacing said second helical spring relative to said plenum chamber.

3,856,043

PRESSURE RESPONSIVE FLUID VALVE ASSEMBLY

Eugene P. Feild, Santa Rosa, and Donald C. Bergstedt, Petaluma, both of Calif., assignors to FNB Products, Inc., Santa Rosa, Calif.

Filed Oct. 30, 1972, Ser. No. 302,382
Int. Cl. F16k *31/363*
U.S. Cl. 137—508 **15 Claims**



1. A fluid valve assembly comprising;

a housing;

means in the housing for defining a valve capable of being opened and closed, said valve having a pair of valve members, one of which is movable, each of the valve members having a working face and the working face of at least of one said valve members has a tapered configuration to define therebetween a transversely wedge-shaped annular space having a maximum separation at the outer periphery in the range of 0.0001 to 0.01 inch, when the valve members are closed;

said housing having inlet means for permitting a flow of fluid thereinto and to a location adjacent to the outer peripheries of the working faces;

one of the valve members having a centrally located orifice extending thereinto from its working face, the working faces being engageable with each other near the orifice to close the valve, the orifice being closed when the valve is closed;

the distance between the orifice and the effective outer periphery of each of the working faces being at least 1.5 times the radius of the orifice;

said housing having a space for receiving a device operable to bias said members toward and into engagement with each other, said wedge-shaped space being in fluid communication with said location so that fluid pressure can cause the valve members to separate from each other when the fluid is at said location to thereby open the valve, whereby the fluid can flow from said location, through said wedge-shaped space past said working faces, and into and through said orifices; and

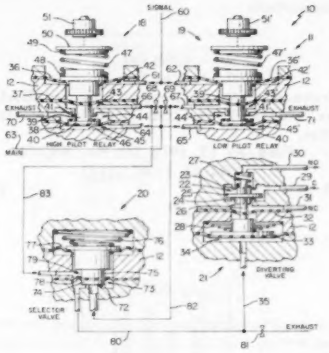
means coupled with the housing for permitting a flow of fluid out of said orifice.

3,856,044

PNEUMATICALLY OPERATED DIVERTING RELAY CONSTRUCTION AND SYSTEM UTILIZING THE SAME OR THE LIKE

Edward N. Caldwell, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Oct. 10, 1973, Ser. No. 405,131
Int. Cl. G05d *23/00*
U.S. Cl. 137—625.5 **20 Claims**



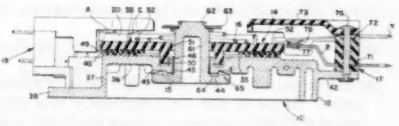
1. A pneumatically operated diverting relay construction comprising first and second pilot relay means and a diverting valve means operatively associated together, said first pilot relay means having means for causing said diverting valve means to switch from one condition thereof to another condition thereof when a pneumatic signal reaches a certain high value, said second pilot relay means having means for causing said diverting valve means to switch from said other condition thereof to said one condition thereof when said pneumatic signal decreases to a certain low value.

3,856,045

VACUUM CONTROL VALVE

Andrew Augustine Kenny, Roselle; Richard Kendall Larson, Streamwood, and Donald Frank Janous, Chicago, all of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 8, 1973, Ser. No. 339,262
Int. Cl. F16k *11/14*
U.S. Cl. 137—625.11 **10 Claims**



1. A vacuum control valve comprising:

a valve body having at least a vacuum inlet and a vacuum outlet leading therein, a generally flat surface having openings extending therein, said inlet communicating with one of said openings and said outlet communicating with the other opening;

a diverter track mounted for relative rotation with respect to said flat surface and having an end plate abutting said flat surface, said plate having two channelled diverter passageways formed therein, at least one passageway communicating with at least one of said openings,

means for pressuring one of said passageways at a first pressure and the other at a second pressure in one position of said valve,

each channelled diverter passageway further defined by contiguous circumferentially extending and radially extending bead surfaces, said circumferentially extending bead surfaces defining inner and outer edges of said passageways and said radially extending bead surfaces defining end edges of said passageways, and

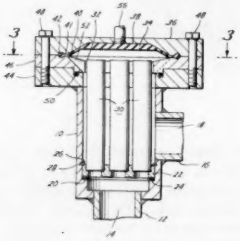
one of said passageway end edges further defined by first and second radially extending substantially parallel bead surfaces contiguous along their entire length and forming a double bead extending between said circumferential bead surfaces.

3,856,046

VALVE

Hart Brown, Houston, and Howard N. Puckett, Hockley, both of Tex., assignors to Tool Instruments Associates Inc., Houston, Tex.

Filed Oct. 17, 1972, Ser. No. 298,272
Int. Cl. F16k *31/145*
U.S. Cl. 137—625.28 **11 Claims**



1. A valve comprising

a tubular body,

means defining a first port at one end of said body,

means defining a second port extending through said body,

a plate extending across the interior of said body and positioned between said first and second port,

a plurality of tubes extending from and in communication through said plate and in parallel relationship to each other and to the axis of said tubular body with each terminating in a separate annular valve seat,

said valve seats being in substantially the same plane,

a diaphragm mounted to move into and from engagement with said valve seats to close and open flow through said tubes, and

a cover connected to the end of said body opposite said first port,

said cover clamping the outer periphery of said diaphragm to said body,

the center portion of said diaphragm being of substantially greater thickness than the remainder of said diaphragm and of sufficient diameter to engage all of said valve seats.

3,856,047

PRESSURE CONTROL VALVE

Katsuki Takayama, Chiryu, Japan, assignor to Aisin Seki Kabushiki Kaisha

Filed Nov. 30, 1972, Ser. No. 310,768
Claims priority, application Japan, Dec. 2, 1971, 46-097424
Int. Cl. F15b *5/00*; **F15c** *3/02*; **F15d** *3/00*; **F16k** *11/07, 11/32*; **G05d** *16/00*
U.S. Cl. 137—625.61 **5 Claims**

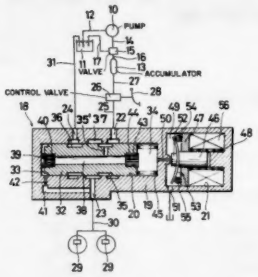
1. In a fluid pressure control system for a vehicle including pressure control valve means disposed between a source of fluid pressure and fluid pressure actuating means, said control valve means comprising:

a housing having a bore therein and a single inlet port, a single outlet port and a single drain port, all directly opening into said bore;

a valve spool slidably mounted within said bore of said housing for controlling fluid communication between said inlet and outlet ports and between said outlet and drain ports, said valve spool defining first and second chambers within said housing;

a first passage means within said housing for supplying said fluid pressure conveyed to said inlet port to said first chamber so as to urge said valve spool in one direction; a first orifice provided within said first passage means;

a second passage means within said housing leading from said first chamber to said outlet port and having a second orifice therein;



a third passage means within said housing for supplying said fluid pressure conveyed to said inlet port to said second chamber so as to urge said valve spool in another direction;

a third orifice disposed within said third passage means;

a second bore in said housing having a drain port;

a flapper valve means disposed in said second bore of said housing adapted to be actuated by an output signal responsive to a vehicle operation condition; and

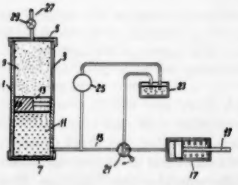
a nozzle in said housing leading from said second chamber being directly open into said second bore and cooperating with said flapper valve means so as to act as a variable orifice to thereby drain said fluid pressure within said second chamber to said second bore.

3,856,048

HYDROPNEUMATIC ACCUMULATOR

Jean Louis Gratzmuller, 66 Boulevard Maurice Barres, Hauts-de-Seine, France

Continuation of Ser. No. 110,951, Jan. 29, 1971, abandoned. This application June 18, 1973, Ser. No. 370,808
Claims priority, application France, Jan. 29, 1970, 70.03103; Dec. 31, 1970, 70.47483; Jan. 29, 1971, 71.00010
Int. Cl. F16l *55/04*
U.S. Cl. 138—31 **9 Claims**



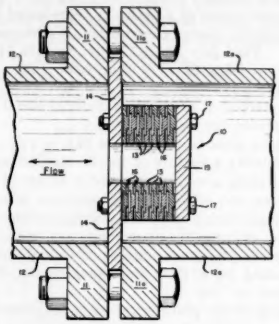
1. A hydropneumatic accumulator comprising a sealed cylinder having a piston slidably located therein and defining with the cylinder a first compartment and a second compart-

ment, the second compartment enclosing a liquid and the first compartment enclosing a body of gas compressed to a maximum operating pressure of at least 200 kg/cm², said gas having a density less than that of nitrogen.

3,856,049
MULTIPLE STAGE RESTRICTOR

William L. Scull, Dover, N.J., assignor to Leslie Co., Parsippany, N.J.

Continuation-in-part of Ser. No. 183,099, Sept. 23, 1971, abandoned. This application Feb. 16, 1973, Ser. No. 332,918
Int. Cl. F15d *1/02*
U.S. Cl. 138—42 **5 Claims**



1. A multiple stage fluid restrictor adapted to be positioned in the path of flow of a fluid through a confining passage which includes an inlet and an outlet port and comprising a stack of superimposed flow-restriction plates, one plate of said stack of superimposed plates being provided with at least one plurality of spaced recesses in one surface thereof of which one of said recesses communicates with one edge of said plate and another of said recesses communicates with the other edge of said plate, and another one of said plates of said stack of superimposed plates being provided with at least one recess positioned between its edges in the surface thereof adjacent the recess-provided surface of the first-mentioned plate, each recess in the other plate extending a sufficient distance across said other plate to partially overlap and thus communicate with successive ones of said plurality of spaced recesses in the first-mentioned plate when the plates are positioned with these two surfaces in contact with one another, the resulting overlapping of the recesses of an adjacent pair of plates thus providing a communicating series of restriction orifices of relatively small cross-sectional area connecting the offset recesses of relatively large cross-sectional area extending between the two edges of said adjacent pair of plates so as to define a path of flow for fluid characterized by repeatedly alternate zones of relatively increased and relatively decreased flow velocity respectively, and baffle means connected to both ends of the stack of plates adapted to close said confining passage except for flow of fluid through the stack of plates from one edge thereof to the other.

3,856,050
FLANGE PROTECTOR

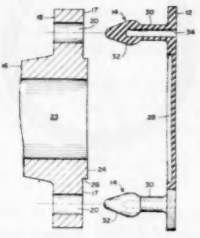
Thomas M. Rooney, 1815 Bristol Cove, Plano, Tex. 75074

Filed Dec. 18, 1972, Ser. No. 315,859
Int. Cl. B65d *59/00;* **F16l** *57/00*
U.S. Cl. 138—96 R **12 Claims**

1. A flange protector for attachment to a machined surface of a flange on a pipe or valve section, the machined surface having a plurality of bolt apertures extending therethrough, comprising:

a plate of flexible material having a shape substantially the same as the shape of the machined surface; and

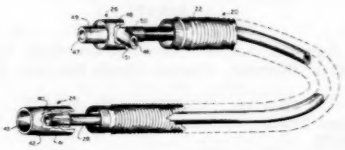
a plurality of connector means integrally formed on said plate and extending perpendicularly from one side of said plate for attaching said protector to the machined surface whereby said plate covers and protects said machined surface, said connector means having a first portion adjacent to said plate and a compressible head formed on the extremity of said first portion, said first portion being of a diameter less than the diameter of said bolt apertures, said head when uncompressed having a portion which has a diameter greater than said bolt apertures, a hollow center extends through said plate, said first portion, and into said head of said connector means whereby insertion of said head portions through said apertures is facilitated.



3,856,051
FLEXIBLE TUBE DEVICE

James A. Bain, 1650 Gloucester Rd., London 12, Ontario, Canada

Filed Jan. 18, 1973, Ser. No. 324,690
Claims priority, application Canada, Feb. 28, 1972, 135657
Int. Cl. F16l *11/12*
U.S. Cl. 138—114 **7 Claims**



1. A two limb flexible pipe comprising:

a. a first flexible thin wall corrugated tubular member with connection means at either end, one of said means having a first and second passage means, first said passage means communicating through the interior of the tubular member with the other connector means;

b. a second flexible essentially thick wall tubular member of smaller diameter generally disposed within the first tubular member, said second flexible member having one end communicating with the second passage means and its other end terminating in the vicinity of the other connector means to communicate thereat with the interior of the first flexible tubular member.

3,856,052

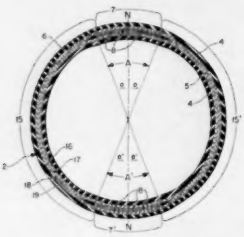
HOSE STRUCTURE

Robert H. Feucht, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire and Rubber Company, Akron, Ohio

Filed July 31, 1972, Ser. No. 276,629

Int. Cl. F16l *11/10*

U.S. Cl. 138—119 17 Claims



1. A material transporting hose of integral construction comprising a body of flexible resilient material including at least one ply of reinforcing material extending generally circumferentially thereof to provide reinforcement against radial forces within the hose and an outer cover surrounding said reinforcing material, a pair of circumferentially spaced longitudinally reinforced portions providing primary resistance to elongation of the hose and constriction of the hose opening caused by excessive end loads, said portions surrounded by said cover so as to be disposed completely within said body on opposite sides of the cross section thereof, said portions each having at least one elongated stress-resisting reinforcing member embedded therein with said member extending generally parallel to the longitudinal axis of the hose and capable of withstanding substantial longitudinal tensile stresses applied to the end of the hose to provide the hose with longitudinal strength, and remaining portions free of said reinforcing members disposed adjacent to said longitudinally reinforced portions on each side thereof with said longitudinally reinforced portions having a total combined perimeter equal to or less than the total combined perimeter of the remaining portions of the cross-section of said body therebetween to provide a hose construction in which at least one-half of the hose remains flexible in a longitudinal direction thereby enabling the hose to be more easily reeled upon itself and less likely to develop kinks.

3,856,053

PIPELINE STRUCTURE

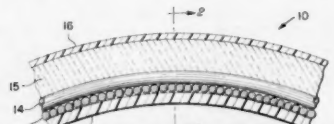
Eric Ingerslev, Assignor: Island International Engineers Limited, Guernsey, Channel Islands Guernsey (Channel Is.)

Filed Apr. 23, 1973, Ser. No. 353,537

Claims priority, application Great Britain, Dec. 1, 1972, 55708/72

Int. Cl. F16l *9/14*

U.S. Cl. 138—153 3 Claims



1. In a high pressure pipeline structure having a diameter of at least about 36 inches, the combination of an internal cylindrical membrane of synthetic plastic material, a set of longitudinal steel rods extending along the outer surface of said membrane in parallel juxtaposed contacting relation with each other, and substantially parallel to the longitudinal axis of the internal cylindrical membrane, a coiled rod wound spirally around said longitudinal rods with the coils thereof in contact with each other, a tubular layer of heat insulating material covering said coiled rods, and a tubular outer shell of synthetic plastic material covering said heat insulating layer, said longitudinal rods and said coiled rod consisting of rod having a strength of at least about 100 tons per square inch and commonly used as pre-stressed rod in concrete, said rods in said pipeline structure being not prestressed.

3,856,054

GLASS POLYMER COMPOSITES

Meyer Steinberg, Huntington Station; Peter Colombo, Patchogue, and Gerald Farber, Elmont, all of N.Y., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed July 28, 1972, Ser. No. 276,211

Int. Cl. F16l *9/00*; B28b *1/08*

U.S. Cl. 138—174 4 Claims

1. The method of preparing a material useful for construction comprising the steps of:

a. crushing glass bottles and the like;

b. formulating a mixture of coarse, medium and fine aggregate having a void volume not in excess of 20 percent;

c. forming said mixture and a monomer selected from the group consisting of styrene, methyl methacrylate, acrylonitrile, isobornyl methacrylate, and trimethylolpropane trimethacrylate with additive into the desired shape;

d. vibrating the mixture containing monomer to eliminate trapped air; and

e. causing in situ polymerization of said monomer.

3,856,055

SHUTTLE CONTROL DEVICE FOR A LOOM

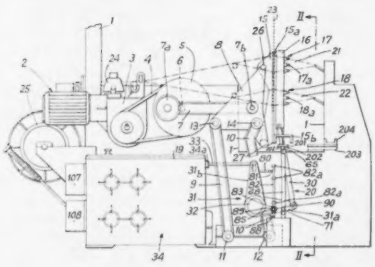
Jean-Jacques Hirsch, Neuilly Sur Seine; Eugene Mayeur, and Jacky Mayeur, both of Montreuil aux-Lions, all of France, assignors to Societe en Commandite par Actions dite: Adolphe & Andre Caen, Paris, France

Filed Sept. 6, 1972, Ser. No. 286,700

Claims priority, application France, Sept. 6, 1971, 71.32161

Int. Cl. D03d *35/00*

U.S. Cl. 139—138 20 Claims



1. A shuttle control device for a loom comprising: a beam capable of executing a substantially horizontal reciprocating movement; a batten guided for vertical movement on one face of the beam and capable of occupying at least two different positions; a plurality of horizontally disposed driving racks mounted on the batten, each driving rack being arranged to act upon a group of shuttles so as to drive the group in a horizontally reciprocating movement along the batten; a plurality of control racks, each drive rack being integral at one end with a respective one of the control racks, each control rack being meshed with a toothed wheel keyed onto a vertically disposed telescopic shaft, having an exterior sheath and an interior rod, the sheath being connected with the batten both for vertical displacement parallel to its axis and also for

horizontal translation of the batten, the sliding interior rod having splines engaged in corresponding splines of the sheath; a self-locking reciprocating driving and selection mechanism having a plurality of output shafts in a number equal to that of said telescopic shafts, a power shaft and a selection shaft controlling the connection between said power shaft and one of said output shafts; a plurality of double-cardan transmission shafts each transmission shaft connecting one end of each sliding interior rod to one of said output shafts; a drive motor connected to the power shaft; and a Jacquard means connected to the selection shaft.

3,856,056

BATTENING APPARATUS IN FLAT WEAVING MACHINE

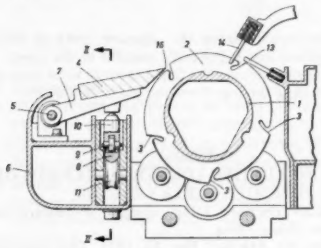
Walther Filter, Langenhagen, Germany, assignor to Vereinigte OSterreichische Eisen-und Stahlwerke-Alpine Montan Aktiengesellschaft, Vienna, Austria and Establissement Wanderfield & Co., Schaan, Liechtenstein

Filed Aug. 13, 1973, Ser. No. 387,721

Claims priority, application Austria, Aug. 18, 1972, 7142/72

Int. Cl. D03d *49/00*

U.S. Cl. 139—291 R **3 Claims**



1. In a flat weaving machine operable to insert successive filling threads between spaced apart warp threads and to beat up the filling threads so as to form a cloth having a fell, the combination of

1. a support for supporting the cloth adjacent the fell,

2. a horizontally extending pivot axis mounting the support for a pivotal movement between positions close to, and away from, a reed,

3. a reed comprising

a. a reed shaft having an axis extending parallel to the pivot axis of the support,

b. a multiplicity of reed discs corotationally mounted on the reed shaft and having dogs adapted to extend between the warp threads and to beat successive ones of the filling threads against the fell, and

c. the reed shaft being operable to perform a succession of angular movements for beating the successive filling threads against the fell, and

4. means pivotally moving the support into the position away from the reed and out of the path of the dogs during the angular movements only at the beginning of each of the angular movements of the reed shaft.

3,856,057

WINDING APPARATUS

Richard K. Mitts, Fullerton, and Hugh Jean Tyler, Santa Ana, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed July 10, 1972, Ser. No. 270,486

Int. Cl. B21d *11/06, 37/16;* **B21f** *3/04*

U.S. Cl. 140—102 **18 Claims**

1. Precision winding apparatus for coiling an elongated strip rendered malleable in a predetermined temperature range and comprising:

a frame;

an elongated mandrel supported by said frame;

first and second clamp means for clamping first and second ends of said strip;

a rotary head mounted from said frame and carrying said second clamp means for orbiting said second clamp means about said mandrel to progressively bend a selected bend area of said strip about said mandrel;

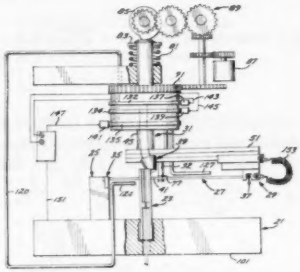
drive means for rotating said rotary head;

pitch control means coupled with said drive means and with said rotary head to shift said rotary head vertically to control the pitch of said coil;

heating means for heating said bend area;

a temperature sensor disposed adjacent said mandrel and arranged to sense the temperature at said bend area; and

temperature control means connected with said heating



means and said temperature sensor and operative in response to upper and lower temperature within said temerature range to control said heating means to maintain the area of said strip sensed by said sensor within said predetermined temperature range whereby said strip may be clamped between said clamp means, said heating means actuated to heat said bend area, said rotary head energized to orbit said second clamping means and said sensor will sense the temperature of said bend area to hold said predetermined temperature range and said pitch control means will shift said head vertically to precisely control the pitch of the resultant coil.

3,856,058

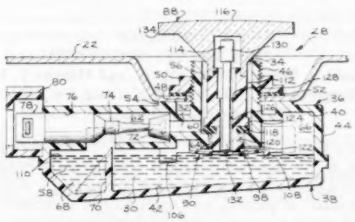
LIQUID DISPENSER HAVING IMPROVED OVERFILL PROTECTOR

George E. Fackler, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Oct. 26, 1973, Ser. No. 410,290

Int. Cl. D06f *39/02*

U.S. Cl. 141—18 **8 Claims**



1. A liquid dispenser comprising:

a liquid reservoir having a fill fitting providing a well opening into the reservoir;

means for selectively dispensing liquid from the reservoir;

means for closing the fill fitting including a valve and means for constraining movement of the valve in response to rising liquid level in the reservoir into sealing engagement with the fill fitting; and

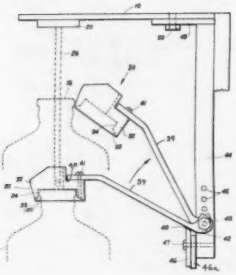
means for draining the well after the valve is closed including a fitting closure having means for opening the valve in response to closing movement of the closure.

3,856,059

CONTAINER CENTERING DEVICE

Thomas P. Hartness, 305 Bridgewater Dr.; Robert G. Hartness, 203 Wilmington Rd., both of Greenville, S.C. 29607, and Thomas S. Hartness, 1101 86th St., Marathon, Fla. 33052

Filed Mar. 7, 1973, Ser. No. 338,990
Int. Cl. B65b *43/42*
U.S. Cl. 141—165 **8 Claims**



1. An apparatus for centering an open top container so that an elongated tube of a liquid filling device can be inserted therein when filling said container with liquid, said liquid filling device including a movable stirrup which supports said container and is capable of being shifted vertically from a loading position to a filling position wherein said elongated tube is inserted in said container, said apparatus comprising: a positioning member having a surrounding wall adjacent a bottom portion defining a recess, an inner camming surface of said surrounding wall being inclined upwardly towards the center of said positioning member, pivotal means supporting said positioning member above said container so that the top of said container engages said inclined inner surface of said positioning member for aligning said top of said container with said tube, and a cam means for engaging said positioning member for forcing said positioning member down on top of said container for insuring proper alignment of said container, whereby said positioning member aligns said container with said tube and is then retracted out of the path of said vertical movement of said container so as to not interfere with filling of said container.

3,856,060

TREE HARVESTING SYSTEM

Donald D. Savage, 2883 Cobb St., and Maurice T. Mills, 108 Margaret Ave., N.E., both of Marietta, Ga. 30060

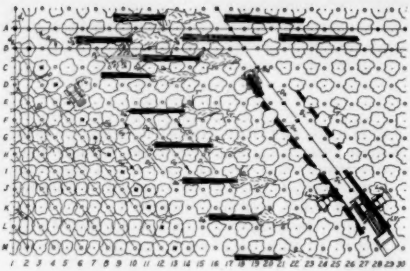
Filed July 27, 1973, Ser. No. 383,115
Int. Cl. A01g *23/08*
U.S. Cl. 144—34 B **13 Claims**

1. A tree harvesting method for selectively thinning trees from a plantation stand in which the trees are arranged in a first series of parallel rows spaced a first prescribed distance apart and in a second series of parallel rows oriented generally normal to the first series of rows and spaced a second prescribed distance apart, said method comprising the steps of:

a. felling the trees lying along diagonals extending through the plantation stand so that alternate trees with each of the first and second series of rows are removed including the sub-steps of:

cutting the standing tree off at its base while holding the tree in an upright position,

moving the thusly cut tree to a position so that it can be laid between adjacent rows of the first series of parallel rows while maintaining the tree in an upright position, and



laying the tree between the adjacent rows so that its longitudinal axis is generally parallel to the rows;

b. delimbing and topping the felled trees to form logs; and,

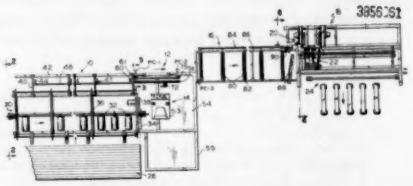
c. transporting the logs from the plantation stand.

3,856,061

METHOD OF CUTTING LUMBER TO RANDOM OR SPECIFIED CLEAR LENGTHS

Thomas R. Miles, Portland, Oreg., assignor to Edward Hines Lumber Co., Hines, Oreg.

Division of Ser. No. 214,011, Dec. 30, 1971. This application Jan. 8, 1973, Ser. No. 321,787
Int. Cl. B27b *1/00*
U.S. Cl. 144—312 **13 Claims**



1. The method of clear-cutting preformed lumber of specified width and thickness dimensions to specified or random lengths comprising the steps:

cutting defects from a piece of lumber at a first defect-cutting station by sensing the defect, severing said piece on opposite sides of each said defect in response to the defect sensing to remove defect-containing sections from said piece and to thereby form a clear piece of lumber of random length extending downstream of said station,

transferring the resulting clear random-length piece from said defect-cutting station to a cut-to-length station,

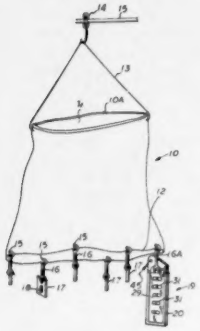
sensing the longest one of several predetermined specified lengths in said random-length clear piece at said cut-to-length station,

and cutting said piece to the longest specified length sensed in response to the longest-length sensing at said cut-to-length station to thereby form a finished clear piece of lumber of specified length.

3,856,062
BAG CLOSURE

Oscar S. Ippolito, 2959 Bronxwood Ave., Bronx, N.Y. 10469

Filed June 8, 1972, Ser. No. 260,756
Int. Cl. B65d 33/16
U.S. Cl. 150—3 11 Claims



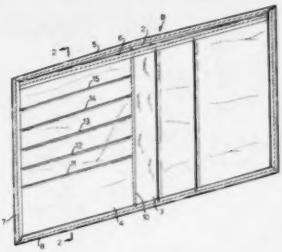
1. In combination:
a load carrying bag having an open end portion through which the contents thereof can be readily unloaded,
a plurality of holding means circumferentially spaced about the periphery of said bag adjacent said open end, and
a closure means for releasbly securing and gathering said holding means to close the open end of said bag for retaining the contents of said bag therein,
said closure means comprising:
a frame means,
a slide means, said slide means and said frame being mounted for relative movement,
said slide means having a plurality of spaced openings formed therein, adapted to receive said holding means,
a latching means operatively associated with each of said openings for releasably securing said holding means received within said openings,
and an actuating means operatively connected to said frame means and slide means to effect relative movement thereof between an operative bag closing position and bag release position whereby said holding means are simultaneously released.

3,856,063
CREDIT CARD BILLFOLD AND MULTI-POCKET LINER THEREFOR

Jan Peter Dengel, West Bend, Wis., assignor to Amity Leather Products Company, West Bend, Wis.

Filed Apr. 2, 1973, Ser. No. 347,200
Int. Cl. A45c 1/08
U.S. Cl. 150—35 2 Claims

1. A multi-card wallet having a pair of flexible walls secured together to form an envelope-like opening therein and into which flat objects may be stored, one of said walls having a plurality of parallel and spaced apart slits cut therein, a generally rectangular and flat plastic pocket liner in said envelope-like opening and secured on three of its edges between said flexible walls, said pocket liner comprising; a back member of heat sealable plastic, a plurality of heat sealable plastic pocket members stacked against said back member, said pocket members and back member being heat sealed together to form a series of upwardly opening pockets, the top edge of said pocket members being in alignment with their respective slits in said one of said walls and cemented therealong to said wall to form a series of single edge pockets arranged in shingled relationship for the reception of cards, said pocket liner being secured along three of its edges between said flexible walls of

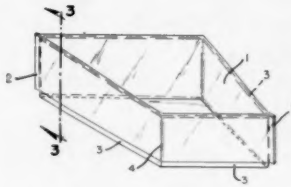


said wallet, whereby said back member presents a smooth surface within said envelope-like opening.

3,856,064
OPEN-TOPPED FOLDABLE RECEPTACLE

Sven Arild Swalleri, Kungsgatan 32, Stockholm, Sweden

Filed Aug. 30, 1971, Ser. No. 176,218
Int. Cl. B65d 5/36
U.S. Cl. 150—49 2 Claims



1. An open-topped collapsible receptacle having a first collapsible position and a second extended position, said receptacle comprising in said first collapsed position:
a. a single piece of fluid impervious sheet material
i. said material having at least 3 downwardly opening parallel and longitudinal folds, with the first and third folds being folded outwardly and downwardly to the same level, said folded material defining first and second longitudinal ends.
ii. at least two upwardly opening folds lying on either side of said center downwardly opening fold
b. at least two transverse end seals sealing the first and second logitudinal ends of said folded material, said seals extending through all downwardly opening folds,
c. at least one longitudinal strip of stiffening material positioned within said first and third folds, said strips extending from one longitudinal end seal to the other,

---

3,856,065
LOCKING SCREW

James H. Gehring, 4080 N. Sagamore Rd., Fairview Park, Ohio 44126

Continuation of Ser. No. 162,086, July 13, 1971, abandoned. This application Jan. 2, 1973, Ser. No. 320,636
Int. Cl. F16b 39/30
U.S. Cl. 151—22 5 Claims

1. A self-locking screw comprising a threaded shank having an integral screw head with a torque receiving means, said threaded shank comprising an entering section and a locking section, said locking section comprising a plurality of back-tapered protuberances connected to said threaded shank between adjacent thread surfaces, each said protuberance forming an angled surface having a gradually inclined face

facing the direction of the screw turn, and a steep sloped face, said protuberances forming locking means running longitudinally to said threaded shank and angularly to said shank threads, each protuberance extending beyond the shank body diameter a distance less than the crest of said threads and

defining a substantially U-shaped configuration having a sharp jagged profile with each end portion of each protuberance engaging an adjacent thread surface and extending up the adjacent thread surface a greater distance from the minor diameter of the screw than the center section of the protuberance.

3,856,066

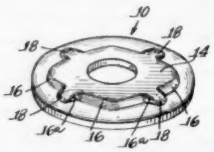
WASHER DEVICE

Richard L. Reynolds, Carpentersville, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Continuation of Ser. No. 169,228, Aug. 5, 1971, abandoned. This application May 10, 1973, Ser. No. 359,035

Int. Cl. F16b *39/24*

U.S. Cl. 151—38 **1 Claim**



1. A dual action spring washer including an annular centrally apertured washer body, said body including a first circumferentially continuous outer marginal spring section which is substantially conical in axial cross section and having a circular outer periphery, a second, inner marginal spring section which is substantially conical in axial cross section and extends axially upwardly beyond said first section, the outer periphery of said second section defining a polygon of at leas four sides and which polygonal periphery is spaced radially inwardly of the outer periphery of said first section to provide said outer marginal spring section with a varying width about its circumference, a short, rigid, strut section integrally joining said first and second sections, said strut section extending generally parallel to the washer axis, the strut section including protuberances which are U-shaped in circumferential cross section and located on each side of the polygon intermediate the corners of the polygonally shaped section, each protuberance including a top wall and a pair of side walls extending radially outwardly from the outer periphery of the inner section the outermost extremities of the side walls and top wall merging with the surface of the outer marginal spring section, the outermost extremity of the top wall and side walls providing a bearing surface for the strut section having a periphery greater than the periphery of the polygonal section, the radial distance from the axis of the apertured washer body to the outermost portion of the protuberances being less than the radial distance from the axis of the aperture to the circular periphery of the first outer marginal spring section, the outer spring section thus being provided with an uninterrupted frustoconical marginal spring-like clamping surface extending radially outwardly of the termination point of the protuberances and corners of the polygon, the marginal periphery of the first section lying on a plane which is spaced axially downwardly from the base of the side walls and U-shaped end walls of the protuberances, the inner marginal periphery defining the aperture in the second section lying in a plane which is spaced axially upwardly from the top wall of the protuberance which allows the outer peripheral surface of the outer spring section to yield axially under load, the side walls of the protuberances being extensions of the strut section and the top wall of the protuberances being narrow extensions of the inner conical section providing circumferentially spaced clamping surfaces adapted to be engaged by a clamping surface such as the clamping surface of a rotary threaded fastener and to uniformly distribute the clamping forces in the dual action spring washer system without significantly altering the spring characteristics of either the inner spring section or the outer spring section and significantly decrease the stress concentration at the junctures of the strut with the inner and outer sections.

3,856,067

PNEUMATIC TIRE

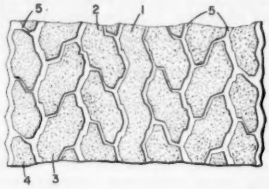
Werner Gorter, Baden, Austria, assignor to Semperit Osterreichisch-Amerikanische Gummiwerke AG, Vienna, Austria

Division of Ser. No. 30,826, April 22, 1970,. This application Mar. 26, 1973, Ser. No. 344,641

Claims priority, application Germany, Nov. 25, 1969, 1959194

Int. Cl. B60c *11/00*

U.S. Cl. 152—209 R **3 Claims**



1. A pneumatic tire includes an outer tread surface which in use contacts the surface of the ground, said tread surface is covered by a vulcanization skin and has a plurality of spaced grooves each of which extends into said tread surface to a depth in the order of centimeters, said grooves defining a plurality of areas of the outer tread surface in which said vulcanization skin is substantially continuous and unbroken, said unbroken vulcanization skin in each of said areas including a substantially regular pattern of arcuate indentations having depths ranging between 0.1 and 1 mm measured from said outer tread surface, and said pattern of said indentations corresponding to the surface pattern of a textile material.

3,856,068

TRACTION DEVICE

John W. Callaghan, and David F. Johnson, both of 215 31st St., both of Boulder, Colo. 80202

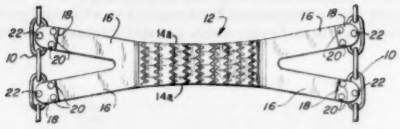
Filed Aug. 2, 1973, Ser. No. 385,091

Int. Cl. B60c *27/02*

U.S. Cl. 152—226 **4 Claims**

1. In a traction device for use upon a vehicle wheel comprising connecting means adapted to extend circumferentially along opposite sides of the vehicle wheel and a plurality of cross link members secured to and extending transversely between said connecting means; the improvement wherein each of said cross links comprises a one piece member of resilient material having a generally rectangular central section having concavely curved leading and trailing edges and integrally joined at each of two opposite ends to a pair of end

sections, said end sections diverging from each other in their extent away from said central section, means including a pair of coupling plates mounted on opposite sides of each end section and projecting beyond the end of said end sections,



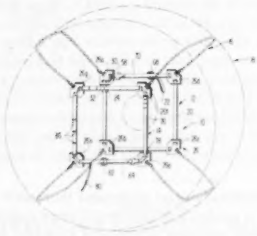
means for compressively mounting said coupling plates on opposite sides of each said end section, and means coupling the projecting portions of said coupling plates to said side chains.

3,856,069

TIRE CHAIN DEVICE

Victor S. Giannone, 952 Central Ave., Peekskill, N.Y. 10566

Filed Oct. 23, 1973, Ser. No. 408,398
Int. Cl. B60c *27/02*
U.S. Cl. 152—233 **5 Claims**



1. A tire chain assembly for a vehicle wheel comprising:
inboard and outboard straps of flexible material, each of said straps having opposite ends releasably secured together, at least one of said straps being of adjustable circumference;
means on said straps forming the straps into rectilinear strap sections;
said means comprising corner plates;
the corner plates having entry slots, exit slots and slant corner slots;
the sections of the respective straps being substantially transversely aligned and substantially parallel to one another;
link chains extending between the inboard and outboard straps at spaced locations; and
the straps extending through said entry and exit slots and the link chains being secured to the corner slots.

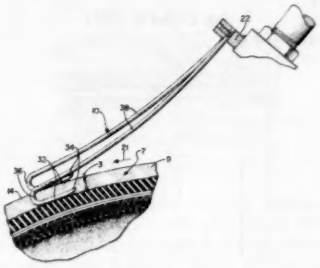
3,856,070

TRANSVERSE FLASH BREAKING IN TIRE MANUFACTURE

Christopher E. Christie, Akron; Paul E. Appleby, Cuyahoga Falls, and Frank R. Tully, Hudson, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 13, 1973, Ser. No. 387,882
Int. Cl. B29h *21/00*
U.S. Cl. 157—13 **1 Claim**

1. Apparatus for treating a new tire having mold flash extending transversely of a circumferentially endless tread groove therein comprising means for mounting said tire rotatably, at least one flash tearing instrument capable of entering said groove, means for mounting said instrument for movement into said groove, and means for effecting relative movement between said tire and said instrument in a direction parallel to said groove to cause said instrument to penetrate and to tear said flash, the or each said instrument comprising



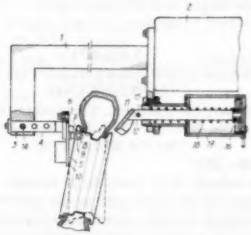
a spring wire hook having an elongated elastically deflectable shank, a shoe portion slidable on a surface or surfaces of the tread of said tire and connected to said shank by a U-shaped bend portion, and a flash penetrator terminal portion.

3,856,071

DEVICE FOR DETACHING TIRE BEADS FROM A WHEEL RIM

Victor Duquesne, Antwerpen, Belgium, assignor to Coulter Electronics Inc., Hialeah, Fla.

Filed May 3, 1973, Ser. No. 356,930
Claims priority, application Belgium, May 9, 1972, 51805
Int. Cl. B60c *25/06*
U.S. Cl. 157—1.26 **4 Claims**

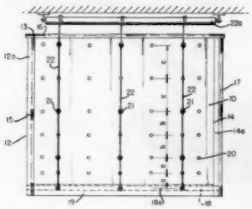


1. Device for detaching the tire beads from a wheel rim, comprising a backing plate, guiding element protruding from said backing plate, a fulcrum on said backing plate spaced from said guiding element, said guiding element and fulcrum being positioned for guiding a wheel placed on a slant with respect to said backing plate, a pressure blade opposite said backing plate for engaging the tire bead, a driving means rigidly attached to said pressure blade for moving said pressure blade in a straight line towards said backing plate in order to detach the tire bead which adheres to the wheel, while swinging said wheel around said fulcrum and over said guiding element in the direction of said backing plate.

3,856,072
FLEXIBLE WALL SECTION, IN PARTICULAR FOR HEATING OR REFRIGERATING CHAMBERS

Erik Ivar Sund, Stockholm, Sweden, assignor to Igloo-Flex AB, Stockholm, Sweden

Filed Jan. 2, 1973, Ser. No. 320,351
Claims priority, application Sweden, Dec. 30, 1971, 16947/71
Int. Cl. A47h *5/032*
U.S. Cl. 160—84 R 2 Claims



1. A flexible wall section for heating or refrigerating chambers having at least one layer of flexible material with good heat insulating capacity, said wall section comprising:

a. coupling means along at least three side edges for fast and releasable interconnection of the section with adjacent wall portions;

b. biased pulling members for folding and removing said wall section when said side edges have been released, said pulling members maintaining said wall section in the removed position,

c. folding indications perpendicular to the direction of removal so as to facilitate folding of said section during the removing operation, and

d. eyelets for each pulling member provided at every second folding indication, said pulling members being attached to the edge parallel with the folding indications and passing through said eyelets,

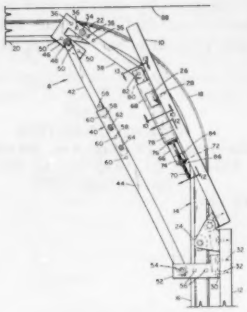
the distance between the folding indications increasing progressively from the lower edge of the section towards the upper edge of the section after each fold so that the upper folds become larger than the lower folds.

3,856,073
OVERHEAD DOOR MOVEMENT CONTROL AND SUPPORT UNIT

J. Marlin Risser, 36 Wash. St., Elizabethtown, Pa. 17022

Filed Dec. 27, 1973, Ser. No. 429,035
Int. Cl. E05d *15/00*
U.S. Cl. 160—201 9 Claims

1. An overhead door movement control and supporting means adapted to be connected to the uppermost two panels of an articulated multiple panel door for guiding the movement thereof to and from closed vertical position and overhead open horizontal position while being supported and guided by a conventional channel type track having vertical and horizontal portions connected by a curved section, said door supporting means comprising in combination guide means adapted to be fixed to the inner surface of the uppermost panel of such multiple panel door adjacent each side thereof and below the upper edge, a guide member longitudinally slidable in each guide means, an extension flexibly connected to each guide member, a guide roller rotatably connected to each extension, said guide roller being engageable within a conventional channel type track within the upper horizontal and curved portions to guide the upper edge of said uppermost panel of said door from a vertically closed position to a horizontal open position within the plane of said horizontal portions of said conventional track means, said guiding being accomplished by said extensions initially being at an angle to said guide members to dispose said rollers initially in predetermined spaced relation from the inner surface of said uppermost door panel and advanced ahead of the upper edge of said panel as opening of said door is initiated, thereby serving to pull said upper edge abruptly from the initial vertical plane thereof toward the horizontal plane while said guide members slide in said guide means and said extensions thereon

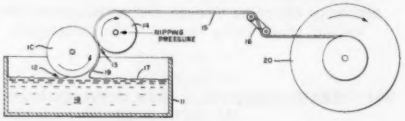


move into substantially axial alignment therewith as said uppermost panel is guided into horizontal open position, and an elongated control member connected between each of the next to the uppermost door panels and the outer end portions of said extension of said guide members and operable to effect said sliding of said guide members relative to said guide means.

3,856,074
METHOD OF CENTRIFUGAL PRODUCTION OF CONTINUOUS METAL FILAMENTS

Sheldon Kavesh, Whippany, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Apr. 6, 1973, Ser. No. 348,814
Int. Cl. B22d *11/06*
U.S. Cl. 164—87 4 Claims



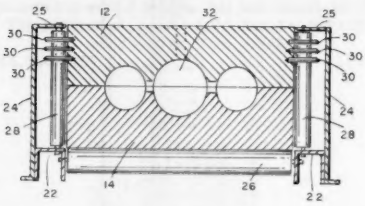
1. In a method for the production of metal filaments from a molten source using a rotating quenching wheel as a quenching element, the improvement which comprises exerting sufficient nipping pressure on the formed filament at a point on the quenching wheel beyond the point of solification of the filament and prior to the point said filament is separated from the quenching wheel by centrifugal action to retain the filament against the quenching wheel and subsequently collecting the filament.

3,856,075

APPARATUS FOR PREVENTING DISPLACEMENT OF MOLDS

Sam Larkin, 254 Beach 140th St., Belle Harbor, N.Y. 11713

Filed Jan. 16, 1973, Ser. No. 324,240
Int. Cl. B22d 33/00
U.S. Cl. 164—323 9 Claims



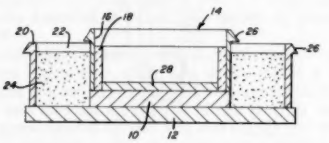
1. A mold securing device for preventing relative displacement of the cope and drag halves of a sand mold during casting, comprising transport means defining a horizontal path along which a mold may progress during a casting process; guide means at least along a portion of said path, said transport and guide means together defining a space through which the mold passes as it moves along said path; and penetrating means disposed at each side of said path at a casting station and having portions which project into said space into the path of movement of the cope halves of the molds to thereby penetrate said cope halves and form elongated grooves in the latter as the molds move along said path for preventing vertical displacement of the latter during the casting process.

3,856,076

APPARATUS FOR CONTAINING THE MOLTEN REACTION PRODUCTS OF A REACTIVE CLADDING PROCESS

Richard C. Adams, Pitcairn Borough, Allegheny County; Robert H. Kachik, Washington Township, Westmoreland County; Arthur J. Pignocco, Franklin Township, Westmoreland County, and Waldo Rall, Fox Chapel Borough, Allegheny County, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 15, 1973, Ser. No. 332,869
Int. Cl. B22d 19/00
U.S. Cl. 164—332 16 Claims



1. Apparatus for containing the molten reaction products of a reactive cladding process, comprising:

a base,

a metal substrate resting on said base,

an outer perimeter shell of predetermined size and configuration resting on said base around said substrate, said shell being substantially larger than said substrate,

a refractory-lined inner perimeter shell of predetermined size and configuration resting on said substrate, enclosing exactly that portion of said substrate to be clad, and spaced from said outer perimeter,

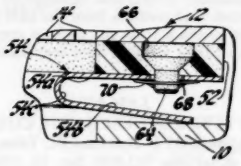
said inner perimeter and said outer perimeter defining an annular space for containing an insulating material, and insulating material in said space.

3,856,077

REGENERATOR SEAL

Donald C. Siegla, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 21, 1973, Ser. No. 343,199
Int. Cl. F28d 19/00
U.S. Cl. 165—9 8 Claims



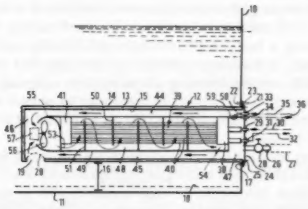
1. In a rotary regenerator heat exchange apparatus having a housing and a matrix carried in said housing for rotation about an axis through two aeriform fluid flow paths including a high pressure fluid flow path and a counterflowing low pressure fluid flow path, the matrix because of these flow paths having a hot side and a cold side and a sealing means disposed between the housing and the matrix on the cold side of the matrix, said sealing means comprising a one-piece wear seal element of graphite filled high temperature plastic material, means associated with the housing and with said wear seal element to retain said wear seal element against rotation and translatory movement transverse to the axis of rotation of the matrix while permitting movement of said wear seal element parallel to the axis of rotation of the matrix, and a leaf seal positioned between the housing and said matrix to bias said wear seal element into sealing engagement with the matrix, each portion of said leaf seal being substantially U-shaped in cross section and having a first leg portion engaging the housing, a second leg portion engaging said seal wear element and an integral arcuate portion therebetween, and retainer means to retain said leaf seal in position within the housing so that the open ends of said U-shaped cross section portions of said leaf seal are acted on by the fluid flowing in the high pressure fluid path.

3,856,078

DEVICES FOR TANKS CONTAINING FLUID MEDIUM

Carsten Dahl, Minde, Norway, assignor to Patents and Developments A/S, Helldal, Norway

Filed May 15, 1973, Ser. No. 360,443
Int. Cl. F28d 1/06
U.S. Cl. 165—108 5 Claims



1. A device within a tank containing fluid medium, especially so-called heavy oils, which comprise an insulated housing submerged in the fluid medium a heat exchanger having an outer jacket arranged in said housing for heating said medium, said housing comprising at its one end a first chamber in the form of an inlet and mixing chamber and at its other end a second chamber in the form of a combined circulation and outlet chamber, said one end being in open flow connection with the surrounding fluid medium and said other end being

in valve-controlled flow connection with a discharge conduit, said first and second chambers being interconnected via at least two separate flow passages within said housing, a pump disposed in the housing adjacent an end of the heat exchanger and adapted to force fluid medium along one flow passage from the first chamber via the heat exchanger into the second chamber while another flow passage permits circulation from said second chamber to said first chamber so as to keep the mixing of heated fluid medium from the heat exchanger and unheated fluid medium from the tank in step with the discharge of heated fluid medium from said discharge conduit.

3,856,079

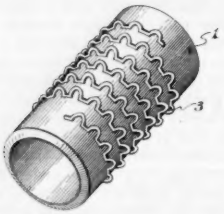
FINNED TUBE HEAT EXCHANGE CONDUCTOR

Elmo W. Geppelt, 1911 S. Delaware Pl., Tulsa, Okla. 74104

Continuation of Ser. No. 702,010, Jan. 31, 1968, abandoned. This application Mar. 23, 1971, Ser. No. 127,338

Int. Cl. F28b *1/36*

U.S. Cl. 165—184 **9 Claims**



1. A finned tube heat exchange conductor comprising a tube, and a heat transfer fin on the tube, the fin comprising an elongated metal member disposed helically about the tube and contacting the tube at a plurality of spaced locations along its helix, said member having portions spaced substantial distances outwardly from the tube between said spaced locations, said fin lying on the locus of the generatrix of its helix.

3,856,080

PACKER DEVICE HAVING A J-LATCH AND SEAL MEANS

Billy Ray Watson, 1000 S. Franklin, Monahans, Tex. 79756

Continuation-in-part of Ser. No. 194,326, Nov. 1, 1971, abandoned. This application Nov. 19, 1973, Ser. No. 417,290

Int. Cl. E21b *23/00, 33/12*

U.S. Cl. 166—120 **11 Claims**

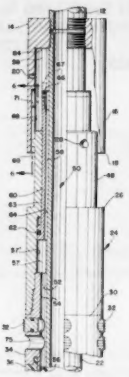
1. A packer apparatus for use downhole in a borehole and which is adapted to be anchored in a well casing, said apparatus having a body, a hollow mandrel slidably received within said body, a housing attached to said mandrel and movable therewith, means forming a lost motion coupling connecting said housing to said body in a manner to permit said housing to be moved axially from a first to a second position relative to said body;

means forming a packer element on said body for expansion outwardly into sealing engagement with a well casing and means connected to said mandrel and to said body for causing said packer element to expand outwardly when said mandrel is moved downhole relative to said body;

said mandrel, housing, and body cooperatively forming an annular chamber therebetween;

means forming a flow passageway for conducting fluid flow into the packer body at a location below said packer elements, into said annular chamber, and through said housing;

a piston reciprocatingly received within said annular chamber, at least part of said piston being disposed within at least part of said housing when said housing is in the first position; seal means on said piston for preventing fluid flow through said flow passageway when said housing is in the first position and for permitting fluid flow through



said flow passageway when said housing is in the second position.

3,856,081

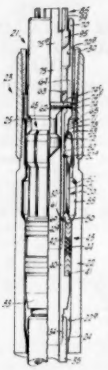
LOCKING DEVICES

Carlos R. Canalizo, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Oct. 2, 1972, Ser. No. 293,869

Int. Cl. E21b *23/00*

U.S. Cl. 166—123 **23 Claims**



1. A locking device adapted for releasable latching along a flow conductor provided with a first locating and supporting shoulder facing in a first direction and a second locking shoulder comprising a cam surface in said flow conductor spaced from said first shoulder and facing in a second opposite direction, said locking device comprising: mandrel means; locating and support means on said mandrel means for locating said locking device at and engaging said first shoulder to hold said device against longitudinal movement in said second direction; and locking means on said mandrel means longitudinally spaced from said locating and support means, said locking means including expander means and expandable means, said expandable means having a cam surface engageable with said cam surface along said flow conductor responsive to movement of said expander means for wedging said device into a longitudinal no-slack relationship and locking said device in

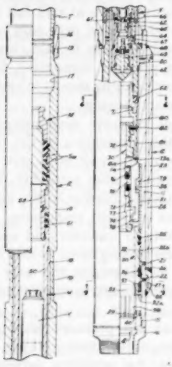
said relationship in said flow conductor between said first and second shoulders, said expander means having an expanding and locking surface tapering inwardly in said second direction.

3,856,082

SELECTIVE POSITIONING WELL TOOL APPARATUS

Robert W. Dinning, Houston, Tex., assignor to Macco Oil Tool Company, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 344,568, March 26, 1973,. This application June 12, 1973, Ser. No. 369,410
Int. Cl. E21b *33/16, 43/12*
U.S. Cl. 166—154 21 Claims



1. Apparatus for selectively positioning well tools within a flow conductor comprising:

tubular receiver means adapted for connection in said flow conductor;

a well tool movable through said flow conductor for entrance into said receiver means;

sleeve means disposed within said receiver means for limited axial movement between closed and opened positions, axial forces acting on said sleeve means, due to pressures to which said sleeve means is subjected, being equally balanced in either said opened or closed positions;

cooperable port means in said sleeve means and receiver means registerable when said sleeve means is in said opened position to provide fluid communication between said well tool and the exterior of said receiver means;

latch means carried by said well tool engageable with said sleeve means on said entrance into said receiver means to latch said well tool therein and to shift said sleeve means to said opened position;

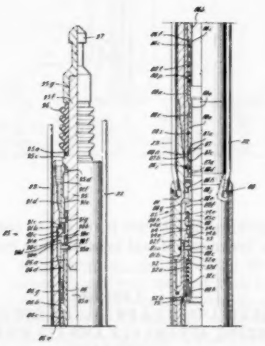
said cooperable port means comprising first and second axially spaced ports in said receiver means communicating with each other, through axial flow means, to provide said flow communication between said well tool and said exterior of said receiver means when said sleeve means is in said opened position, said second port communicating with the exterior of said receiver means through said sleeve means, when said sleeve means is in said opened position, seal means being disposed between said sleeve means and said receiver means for blocking said communication between said second port and said exterior of said receiver means, when said sleeve means is in said closed position.

3,856,083

WELL APPARATUS FOR RECEIVING AND OPERATING A THROUGH THE BORE RECEIVABLE SAFETY VALVE

James D. Mott, Houston, Tex., assignor to Hydril Company, Los Angeles, Calif.

Division of Ser. No. 131,629, April 6, 1971, Pat. No. 3,762,471. This application June 12, 1973, Ser. No. 369,261
Int. Cl. E21b *43/12*
U.S. Cl. 166—224 A 10 Claims



1. An apparatus adapted for mounting in a well tubing for receiving a well flow control means movable through a bore of the well tubing to the apparatus for being received with the apparatus and operable by the apparatus between flow enabling and flow blocking positions for controlling flow of well fluids through the well tubing, including:

a. a housing having a bore therethrough and having means for connecting at its upper and lower ends with the well tubing with said bore communicating with the bore of the well tubing for providing a flow passage through said housing for the well fluids;

b. means with said housing for transmitting controlled movement to the through the bore movable flow control means received in said housing for effecting desired operation of the flow control means to control the flow of well fluids through said bore; and

c. means in said bore for positioning the flow control means in said bore for controlling flow of fluid in the tubing.

3,856,084

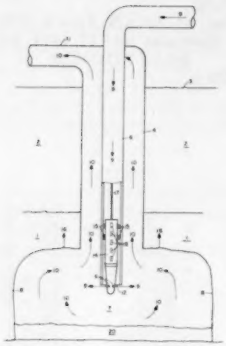
AN IMPROVED BLIND BOREHOLE BACK-REAMING METHOD

Roger C. Parsons, Ponca City, Okla., assignor to Continental Oil Company, Ponca, Okla.

Filed June 7, 1973, Ser. No. 368,010
Int. Cl. E21b *43/24*
U.S. Cl. 166—257 8 Claims

1. In the blind borehole backreaming method for gasifying subterranean carbonaceous deposits by injecting oxygen-containing gas into a subterranean carbonaceous deposit through an injection pipe positioned in a substantially vertical wellbore penetrating said deposits, gasifying said deposits by partially combusting said deposits at a fire front and recovering gasification products through said wellbore; the improve-

ment comprising; positioning a high temperature injection nozzle in the lower portion of said injection pipe to control the



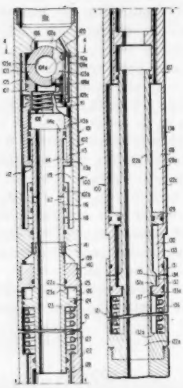
upward advance of said fire front and to control the rate at which the lower end of said injection pipe melts.

3,856,085

IMPROVED ANNULUS PRESSURE OPERATED WELL TESTING APPARATUS AND ITS METHOD OF OPERATION

John C. Holden, and Gary Q. Wray, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Nov. 15, 1973, Ser. No. 412,881
Int. Cl. E21b *47/00*
U.S. Cl. 166—264 **6 Claims**



1. A method for conducting formation testing utilizing
a formation testing string;
a formation testing valve assembly incorporated in a lower portion of said formation testing string; and
a packer assembly incorporated in a lower portion of said formation testing string and operable to isolate a formation to be tested from an upper portion of a well bore within which said formation testing string is positioned, with said formation testing valve assembly being operable to control a flow of formation fluid between said formation and the interior of said formation testing string;
said method being characterized by improvements in testing valve operation comprising:
providing full opening formation testing valve means in said formation testing valve assembly operable to move between closed and open conditions,
said full opening formation testing valve means, in said open condition, being operable to provide a formation fluid transmitting opening extending generally centrally and longitudinally of said formation testing string;
providing annulus pressure responsive, full opening formation testing valve closing means in said formation testing valve and having
first, annulus pressure responsive, force generating means operably responsive to the pressure of fluid in an annulus in a well bore generally adjacent said formation testing valve assembly to generate in said well bore a first biasing force, and
first, annulus pressure responsive, force transmitting means operable to transmit said first annulus pressure generated biasing force to said full opening formation testing valve means and urge said full opening formation testing valve means to said closed condition;
providing annulus pressure responsive, full opening formation testing valve opening means in said formation testing valve assembly and having
second, annulus pressure responsive, force generating means operably responsive to the pressure of fluid in said annulus of said well bore generally adjacent said formation testing valve assembly to generate in said well bore a second biasing force, and
second, annulus pressure responsive, force transmitting means operable to transmit said second annulus pressure generated biasing force to said full opening formation testing valve means and urge said full opening formation testing valve means to said open condition; and
operating said annulus pressure responsive, full opening formation testing valve closing means, said annulus pressure responsive, full opening formation testing valve opening means, and said full opening formation testing valve means in combination to provide said closed and open conditions in response to changes in fluid pressure in said annulus while permitting a relatively unobstructed flow of formation fluid generally centrally and longitudinally of said formation testing string through said formation testing valve assembly when said full opening formation testing valve means is in said open condition.

2. An apparatus for conducting formation testing including a formation testing string;
a formation testing valve assembly incorporated in a lower portion of said formation testing string;
a packer assembly incorporated in a lower portion of said formation testing string and operable to isolate a formation to be tested from an upper portion of a well bore within which said formation testing string is positioned, with said formation testing valve assembly being operable to control a flow of formation fluid between said formation and the interior of said formation testing string;
said apparatus being characterized by improvements in said formation testing valve assembly comprising:
full opening formation testing valve means included in said formation testing valve assembly and movable between closed and open conditions,
said full opening formation testing valve means, in said open condition, being operable to provide a formation fluid transmitting opening extending generally centrally and longitudinally of said formation testing string;
annulus pressure responsive, full opening formation testing valve closing means included in said formation testing valve assembly and having
first, annulus pressure responsive, force generating means operably responsive to the pressure of fluid in an annulus in a well bore generally adjacent said formation testing valve assembly to generate in said well bore a first biasing force, and
first, annulus pressure responsive, force transmitting

means operable to transmit said first annulus pressure generated biasing force to said full opening formation testing valve means and urge said full opening formation testing valve means to said closed condition;

annulus pressure responsive, full opening formation testing valve opening means included in said formation testing valve assembly and having

second, annulus pressure responsive, force generating means operably responsive to the pressure of fluid in said annulus of said well bore generally adjacent said formation testing valve assembly to generate in said well bore a second biasing force, and

second, annulus pressure responsive, force transmitting means operable to transmit said second annulus pressure generated biasing force to said full opening formation testing valve means and urge said full opening formation testing valve means to said open condition; and

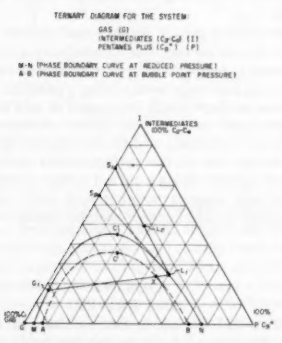
said annulus pressure responsive, full opening formation testing valve closing means, said annulus pressure responsive, full opening formation testing valve opening means, and said full opening formation testing valve means being operable to provide said closed and open conditions in response to changes in fluid pressure in said annulus while permitting a relatively unobstructed flow of formation fluid generally centrally and longitudinally of said formation testing string through said formation testing valve assembly when said full opening formation testing valve means is in said open condition.

3,856,086

MISCIBLE OIL RECOVERY PROCESS

William B. Braden, Jr., Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Oct. 6, 1972, Ser. No. 295,771
Int. Cl. E21b *43/16*
U.S. Cl. 166—274 **18 Claims**



1. A process for recovering hydrocarbons from a hydrocarbon-bearing reservoir having a hydrocarbon liquid phase and a gas saturation, traversed by at least one injection well and one production well, comprising the steps of:

a. determining the composition of a hydrocarbon solvent that is miscible on first contact with said liquid phase at the temperature and pressure of said reservoir,

b. injecting into said reservoir via said injection well a slug of said hydrocarbon solvent in an amount sufficient to establish a miscible transition zone of said slug with said hydrocarbon liquid phase,

c. injecting into said reservoir a drive fluid at a pressure and in an amount sufficient to maintain a drive of said slug and said reservoir hydrocarbons toward said production well and,

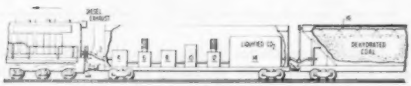
d. recovering said hydrocarbons via said production well.

3,856,087

METHOD FOR LOADING AND TRANSPORTING COAL

Lloyd L. Wartes, 550 E. 12th Ave., Suite 1905, Denver, Colo. 80203

Filed Oct. 24, 1972, Ser. No. 300,032
Int. Cl. A62c *1/14*
U.S. Cl. 169—45 **4 Claims**



1. A method of transporting coal including the steps of injecting liquid carbon dioxide into the coal while loading the coal into a coal compartment to reduce the temperature of the coal to below its ignition temperature and to surround it in a fire-suppressing atmosphere, providing said coal compartment with a protective atmosphere containing sufficient carbon dioxide to prevent ignition and combustion of the coal, propelling the coal in the protective atmosphere with an engine which produces exhaust fumes, processing the exhaust fumes by compression and cooling them to liquefy and recover the carbon dioxide therefrom, storing the carbon dioxide, and utilizing the carbon dioxide recovered from the engine exhaust for said injecting step and for providing the protective atmosphere.

3,856,088

METHOD OF EXTINGUISHING OIL AND GAS WELL FIRES

Alvin J. Frisque, La Grange, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Dec. 29, 1971, Ser. No. 213,843
Int. Cl. A62c *3/04*, *1/20*
U.S. Cl. 169—46 **6 Claims**

1. A method for extinguishing oil and gas well fires which comprises injecting into said well at a point below the fire a stable liquid dispersion of a water soluble anionic vinyl addition polymer and a water soluble cationic polymer comprising:

A. a polymeric latex composed of a water-in-oil emulsion which contains dispersed therein a finely-divided water soluble anionic vinyl addition polymer, said polymeric latex having uniformly distributed therethroughout;

B. a water soluble cationic polymer:

with the weight ratio of (A) to (B) being within the range of 1:10 to 10:1 and the total amount of (A) plus (B) present within said dispersion being within the range of from 5 to 75 percent by weight, and then inverting the liquid dispersion in the well to produce a three-dimensional water and hydrocarbon liquid insoluble gel-like structure which seals off said well; thereby extinguishing said fires.

4. The method of claim 1 wherein the inversion is accomplished by first injecting into said well prior to the injection of the stable liquid dispersion an aqueous liquid which contains 0.1 to 5 percent by weight of a water soluble surfactant or a water soluble caustic material.

3,856,089

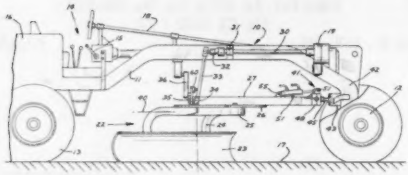
DRAWBAR SUPPORT FOR LEVELING CIRCLE FRAME ON ROAD GRADERS

Theodore Rivinius, 810 N. 2nd St., Bismarck, N. Dak. 58501

Continuation-in-part of Ser. No. 267,434, June 29, 1972, abandoned. This application Sept. 20, 1973, Ser. No. 398,947

Int. Cl. E02f 3/76

U.S. Cl. 172—4.5 13 Claims



1. In grading machines having an earth working blade, a circle frame member for mounting said blade for rotation about an upright axis, a main frame, and means for connecting said circle frame to said main frame comprising a drawbar member attached at one end thereof to said circle frame, means between said circle frame and said main frame to raise and lower said circle frame and first pivot means attaching the other end of said drawbar member to said main frame, said drawbar member including two drawbar portions, means forming a second pivot connection between said drawbar portions adjacent the first pivot means, and having a pivot axis generally transverse to the direction of movement of the road grader, and means interconnecting the two pivoted drawbar portions to control the angular relationship between the two pivoted drawbar portions to level said circle frame at different depth positions of said circle frame.

3,856,090

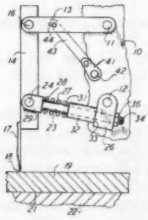
SOD CUTTER BLADE MOUNTING

Donald G. Haffner, Greendale, and Anthony J. Saiia, South Milwaukee, both of Wis., assignors to Jacobson Manufacturing Company, Racine, Wis.

Filed Feb. 15, 1974, Ser. No. 442,877

Int. Cl. A01b 45/04

U.S. Cl. 172—20 6 Claims



1. A sod cutter blade mounting for use in a sod cutting machine, comprising a sod-cutter blade uprightly disposed, two spaced-apart pivot mounting members, a link pivotally associated between said blade and one of said mounting members for swingably mounting said blade for movement from above and into and out of the sod being traversed by the sod cutting machine, a bracket mounted on the other of said mounting members, a rod pivotally associated with said blade and slidably mounted on said bracket for controlling the swinging movement of said blade, and a compression spring on said rod and disposed intermediate said bracket and said blade for yieldingly urging said blade away from said bracket and allow said blade to have rearward movement relative to the sod cutting machine and the forward movement thereof and to thereby momentarily remain embedded in the sod while the sod cutting machine advances forwardly.

3,856,091

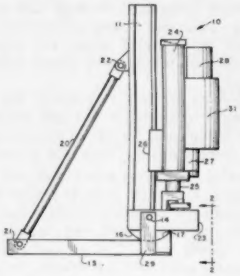
ADJUSTABLE DRILL SUPPORT

Norman Dean Dyer, Beaumont, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 3, 1973, Ser. No. 403,126

Int. Cl. E21c 11/00

U.S. Cl. 173—39 6 Claims



1. An earth boring machine, comprising: base means for supporting said machine,

at least one support member extending out from said base means,

drilling means that travel along said support member for providing drilling forces,

hinge means for rotatably connecting said support member to said base means, said hinge means being a pin connection,

brace means connecting said support member and said base means,

a friction surface means on said base means, said friction surface means on said base means being a curved surface immediately below said support member with said curved surface on said base means being a concave surface, and a friction surface means connected to said support member proximate said friction surface means on said base means for contacting said friction surface means on said base means, said friction surface means connected to said support member being a curved surface positioned on the end of said support member with said curved surface connected to said support member being a convex surface.

3,856,092

POST DRIVER

Morley Mann, 221 Normandy Dr., Addison, Ill. 60101

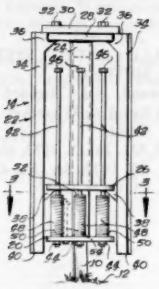
Filed Apr. 10, 1973, Ser. No. 349,716

Int. Cl. B25d 1/00

U.S. Cl. 173—122 3 Claims

1. A manually operable driver for the post or the like comprising a first, inner tube having a cap at the upper end thereof and adapted to overlie a post or the like to be driven with the cap impinging against the top of said post or the like, a reaction disc fixed to said tube adjacent the lower end transversely thereof, a ram having a second tube telescoping over said first tube and adapted to slide longitudinally relative thereto, said ram having a substantial mass including a transverse weight base adjacent the upper end thereof and further having a reaction disc secured to the ram tube adjacent the lower end and extending transversely thereof, guide rods extending from one of said reaction discs through the other thereof in sliding relation relative to the other thereof, and a plurality of compression springs respectively encircling said guide rods be-

tween said reaction discs and in lost motion connection with said reaction discs, whereby downward movement of said ram



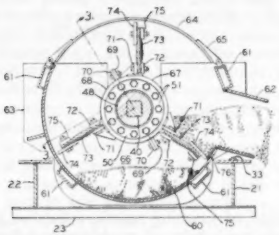
imposes a driving load on said first tube and said springs thereafter providing an upward restoring force of said ram.

3,856,093

SPOIL EJECTOR FOR HORIZONTAL EARTH AUGERING MACHINE

Carl J. Case, Gasport, N.Y., assignor to The Salem Tool Company, Salem, Ohio

Filed Dec. 12, 1973, Ser. No. 426,641
Int. Cl. E21c *1/14*
U.S. Cl. 173—152 **10 Claims**



1. In an augering machine for drilling horizontal holes in the earth and for simultaneously placing lengths of pipe therein, said machine including an auger and cutting head, rotary drive means for said auger and cutting head and a traveling carriage for advancing said auger and cutting head and a length of pipe positioned coaxially around said auger, simultaneously into the hole whereby spoil dislodged by said cutting head is conveyed rearwardly through said pipe by said auger, the improvement which comprises:

means defining a spoil ejector chamber adapted to receive spoil for said pipe,

a plurality of rotary paddles located in said chamber and adapted to engage and propel spoil deposited in said chamber,

resilient means connecting said paddles to said rotary drive means for rotation with said auger, and

stationary unflexing means located in said chamber for abruptly releasing paddles, the flexing means of which are flexed, as the paddles reach a predetermined angular position in said chamber,

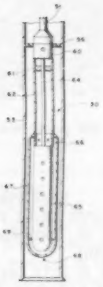
whereby when each paddle passes said unflexing means its respective resilient means unflexes abruptedly and said paddle springs forward to fling spoil in a direction laterally of said carriage.

3,856,094

APPARATUS FOR UTILIZING COMPATIBLE PERFORATING FLUID IN WELL BORES

Mike Davis, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 1, 1973, Ser. No. 411,982
Int. Cl. E21b *43/116*
U.S. Cl. 175—4.52 **6 Claims**



3. An apparatus for perforating casing in an earth borehole, comprising:

an elongated instrument adapted to traverse said borehole; a reservoir within said instrument;

a piston within said reservoir dividing said reservoir into an upper section and a lower section, said upper section having at least one intake port for receiving borehole fluids;

a perforating section connected to the lower end of said instrument having a plurality of perforating elements therein; and

means for releasing at least a portion of any fluid in said lower section of said reservoir into the borehole at a point at least to the lower extremity of said perforating elements and to pump any borehole fluid displaced by said lower section fluid into said upper section of said reservoir.

3,856,095

APPARATUS FOR FORMING AND LOADING A SHOT-HOLE

James C. Adair, Bellaire, and Robert R. Luke, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 275,857, July 27, 1972, Pat. No. 3,804,182. This application Oct. 4, 1973, Ser. No. 403,371
Int. Cl. E21b *19/08, 7/18*
U.S. Cl. 175—203 **5 Claims**

1. Apparatus for forming and loading a shothole comprising:

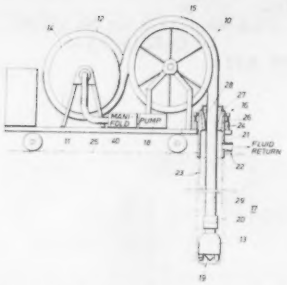
a spooled flexible conduit;

a hydraulic jet nozzle rotatably attached to one end of the flexible conduit, the bottom of said nozzle having an opening of diameter sufficient to allow passage of an explosive detonating means, said opening being closed with a frangible plug which may be expelled from the opening upon application of a sufficient pressure drop across the face of the hydraulic jet nozzle;

pump means for delivering pressurized fluid to the hydraulic jet nozzle; and

manifold means coupling the pump means to the opposite

ends of the flexible conduit, said manifold means comprising a plurality of material storage means in fluid communication with the pump means and the flexible conduit.

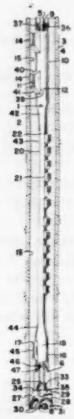


3,856,096

DRILL STRING AND DRILL COLLAR THEREFOR

Edward B. Williams, Jr., P.O. Box 648 103 Mullaney Rd., Greenville, Tex. 75401

Filed Nov. 9, 1973, Ser. No. 414,239
Int. Cl. E21c 9/00; E21b 7/10
U.S. Cl. 175—325 **12 Claims**



1. A drill collar comprising:

a. an elongated tubular drill stem having a longitudinal axis and opposite ends adapted for connection into a drilling string between a drill bit and a column of drill pipe to provide the stem for the drill bit, said drill stem having an upper end portion and a lower end portion and an intermediate portion therebetween, said intermediate portion of said drill stem having a cross section smaller than said upper end portion and said lower end portion, said intermediate portion having the center of gravity thereof positioned laterally of the longitudinal axis of said drill stem;

b. at least one pad secured to said upper end portion and extending around a minor portion of a peripheral surface thereof, said pad on said upper end portion having a face for wiping contact with a wall of a borehole to provide lateral support for said drill stem; and

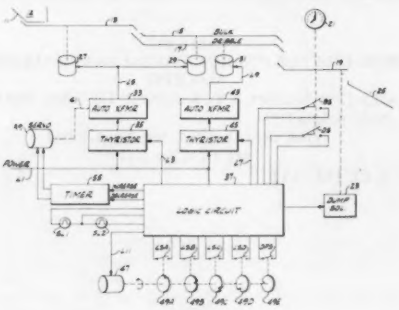
c. at least one pad secured to said intermediate portion of said drill stem and extending around a minor portion of a peripheral surface of said intermediate portion and positioned in diametrically opposed relation with said pad on said upper end portion.

3,856,097

AUTOMATIC SCALE CONTROL SYSTEM AND METHODS

John S. Bartlo, Ridgewood, N.J.; Richard W. Safranski; Charles G. Hart, and David A. Wieseckel, all of P.O. Box 571, Sheboygan, Wis. 53081

Division of Ser. No. 321,531, Jan. 5, 1973, abandoned. This application Dec. 28, 1973, Ser. No. 429,698
Int. Cl. G01g 13/02
U.S. Cl. 177—1 **15 Claims**



1. A method of weighing repetitive batches of a fluent product, each batch being of predetermined finish weight, comprising the steps of:

1. initiating the delivery of the fluent product to a scale via first feed means at a first delivery rate;
2. initiating delivery of the product to the scale via second feed means at a second delivery rate which is substantially lower than said first rate;
3. terminating delivery of the product to the scale at said first rate when a predetermined total first weight of product delivered to the scale is weighed by the scale;
4. terminating delivery of the product at said second rate when a predetermined total second weight of product delivered to the scale is weighed by the scale whereby a batch of said predetermined finish weight is accumulated on the scale;
5. establishing a predetermined time interval during which the predetermined total second weight of product weighed by the scale is to be reached;
6. automatically changing at least one of said first and second delivery rates if the predetermined total second weight weighed by the scale is not reached within said time interval so as to cause said predetermined second weight weighed by the scale to be reached within said time interval;
7. discharging from the scale the product batch of said predetermined finish weight; and
8. repeating steps (1) through (7).

3,856,098

SPRING BALANCE APPARATUS PROVIDED WITH COMPENSATION FOR MEASURING ERROR DUE TO TEMPERATURE CHANGES

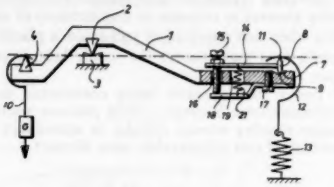
Ernst Kuhnle, Balingen, Wurttemberg, Germany, assignor to Bizerba-Werke Wilhelm Kraut KG, Balinger/Wurtt, Germany

Filed Aug. 28, 1973, Ser. No. 392,346

Claims priority, application Germany, Aug. 29, 1972, 2242445

Int. Cl. G01g 3/18

U.S. Cl. 177—227 6 Claims



1. A spring balance apparatus comprising: an elongated weighing lever having a weighing side at one end thereof adapted to receive a mass to be weighed, and a biasing side on the other end thereof with a seat on one surface adapted to receive a biasing force; biasing means for exerting a biasing force on said seat in a direction substantially perpendicular to the longitudinal dimension of said weighing lever; a knife-edge member extending in a direction substantially perpendicular to the longitudinal dimension of said weighing lever, having a first pivot end contacting said seat and a second end associating with said biasing means for transferring the force exerted thereby to said seat; an actuating lever rigidly connected at one of its ends to said knife-edge member, extending in a direction substantially parallel to the longitudinal dimension of said weighing lever, and pivoting relative to said weighing lever about said pivot end of said knife-edge member; an elongated bimetallic element having one end fixedly mounted on the surface of said weighing lever opposite from said seat, and the other end spaced from said weighing lever, aligned with the end of said actuating lever remote from said knife-edge member, and free to move toward and away from said actuating lever; spacer means for engaging the free end of said bimetallic element and the end of said actuating lever remote from said knife-edge member, and for maintaining a predetermined spacing therebetween; biasing engagement means attached to said actuating lever intermediate said knife-edge member and said spacer means, and to said bimetallic element intermediate said fixed end and said free end for biasing together said actuating lever and said bimetallic element; and a fulcrum point on said weighing lever intermediate said weighing side and said biasing side, about which said weighing lever is free to pivot; said bimetallic element, said knife-edge member, said actuating lever and said biasing means associating in such a manner that an excursion of said bimetallic element as a result of a temperature change pivots said actuating lever about the pivot end of said knife-edge member, and thereby changes the spacing between said fulcrum and the second end of said knife-edge member through which the force exerted by the biasing means transfers, hence modifying the ratio of transmission of forces to compensate for measuring error that would otherwise occur due to temperature change.

3,856,099

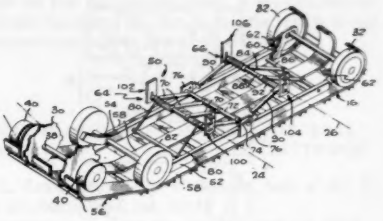
SNOWMOBILE ADJUSTABLE SUSPENSION

Michael R. Bowers, Westminster, Calif., assignor to Yamaha International Corporation, Buena Park, Calif.

Filed July 23, 1973, Ser. No. 381,805

Int. Cl. B62m 27/02

U.S. Cl. 180—5 R 4 Claims



1. A snowmobile comprising:

a chassis having a seat for holding a rider;

ski means mounted at the front portion of the chassis for supporting the front portion thereof on the ground;

a track drive assembly mounted at the rear portion of the chassis, including a track extending in a loop, a sprocket wheel at the front of the track loop, and a tension wheel at the rear of the track loop which holds the track under tension;

an engine mounted on the chassis and coupled to the sprocket wheel to rotate it and thereby drive the track to move the chassis along the ground;

a pair of laterally spaced rails disposed within the track loop and bearing against the track, said rails attached to the tension wheels so that the rails can keep the tension wheels from shifting forwardly;

a suspension assembly for mounting the chassis on the rails and for preventing the rails from shifting forwardly, said suspension assembly having suspension arm means with lower portions connected to the rails and upper portions, and spring means urging the upper portions of the arm means upwardly with respect to the rails;

first guide means having a primarily vertically extending guideway which extends continuously between the lowest and highest location therealong;

second guide means engaged with said guideway and moveable continuously therealong so that relative movement is vertical, one of the guide means attached to the chassis and the other attached to the upper end of the suspension arm means so that the upper end of the suspension arms means is confined to primarily vertical movement relative to the chassis; and

an adjustor coupled to the two guide means for holding the second guide means at selected positions along the vertical guideway of the first guide means, whereby to permit raising and lowering of the chassis while preventing uncontrolled forward shifting of the rails to thereby keep the track under tension.

3,856,100

ENGINE COOLING AND NOISE ABATEMENT SYSTEM

Donald L. Manning, Orchard Lake, Mich., assignor to General Motors Corporation, Detroit, Mich.

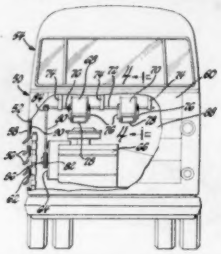
Filed Oct. 11, 1973, Ser. No. 405,414

Int. Cl. B60k 11/08

U.S. Cl. 180—54 A 3 Claims

1. An engine cooling and noise abatement system adapted for use in a truck or coach, said system comprising an encapsulated compartment except for a first opening formed in a first wall of said compartment, and second and third openings formed in a second wall of said compartment, a plurality of

louvers mounted in said first opening, a radiator mounted in said compartment immediately adjacent said first opening, an engine mounted in said compartment so as to have the end of its crankshaft positioned adjacent said radiator, a shaft rotatably mounted in said compartment adjacent a side of said engine, a pair of squirrel cage fans mounted on said rotatably



mounted shaft, a first pulley secured to said crankshaft, a second pulley secured to said rotatably mounted shaft, and an endless belt mounted around said first and second pulleys, said pair of squirrel cage fans having their respective outlets mounted in said second and third openings in said encapsulated compartment to thereby exhaust to the atmosphere.

3,856,101

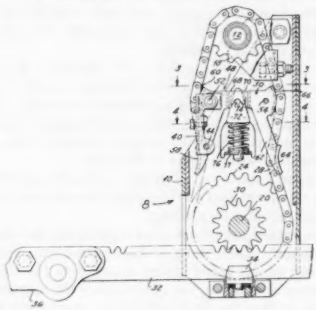
POWER STEERING DEVICE

William D. Allison, Grosse Pointe Farms, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 4, 1973, Ser. No. 347,962

Int. Cl. B62d *5/06*

U.S. Cl. 180—79.2 R **6 Claims**



2. A power steering unit for a motor vehicle steering system comprising a housing and an input sprocket rotatably supported in said housing;

said input sprocket being constructed to be connected to a vehicle steering wheel;

an output sprocket rotatably supported in said housing;

a pinion rigidly secured to said output sprocket;

a rack slidably supported in said housing and in mesh engagement with said pinion;

said rack being constructed to be connected to a steering linkage mechanism;

a drive chain drivably interconnecting said input and output sprockets and having laterally spaced apart first and second spans extending between said sprockets;

a combination chain tensioner and load sensing means comprising a laterally displaceable support connected to said housing;

first and second members pivotally supported on said support and engaging said first and second spans, respectively;

each of said members engaging its respective span at two spaced locations;

spring means coupled to said first and second members and urging said members into engagement with said first and second spans;

each of said spans normally having a generally ogee configuration in response to the spring force exerted by said spring means on said first and second members;

said first and second members and said support being laterally displaceable in response to a tensile load in one of said spans that exceeds a tensile load in the other of said spans;

a power steering valve having a valve body supported on said housing and a laterally displaceable valve element situated within said body;

means coupling said valve element with said first and second members;

said coupling means being constructed to displace said valve element in response to displacement of said members when said one span of said chain is placed under a tensile load that exceeds the tensile load in said other span;

said power steering valve being constructed to provide communication between a fluid pressure source and a power steering booster cylinder in accordance with the position of said displaceable valve element.

3,856,102

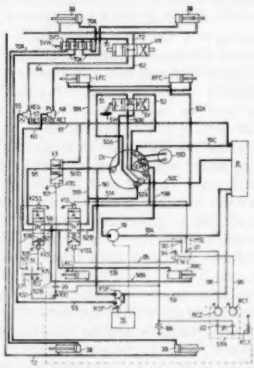
ELECTRO-HYDRAULIC STEERING SYSTEM FOR VEHICLE HAVING STEERABLE FRONT AND REAR GROUND WHEELS

William B. Queen, Cedar Rapids, Iowa, assignor to Harnischfeger Corporation, Milwaukee, Wis.

Filed July 11, 1973, Ser. No. 378,125

Int. Cl. B62d *5/08*

U.S. Cl. 180—79.2 C **4 Claims**



1. In a vehicle comprising steerable front and rear wheels; front and rear steering actuators for said front and rear wheels, respectively, and operable to move said wheels to steer said vehicle; a pump for supplying operating fluid to said steering actuators; a steering wheel; a steering valve operable in response to movement of said steering wheel to direct fluid from said pump to said front steering actuator; control means including a mode selector device having conventional, crab and tight steer positions and a mode valve; said control means when said mode selector device is in conventional steer position effecting operation of said mode valve to prevent said pump from supplying fluid to said rear steering actuator; said control means when in said mode selector device is in either

crab or tight steer position effecting operation of said mode valve to connect said steering valve to direct fluid to said rear steering actuator, said control means further comprising a centering valve and means responsive to rear wheel position to operate said centering valve to direct fluid to said rear steering actuator to effect return of said rear wheels to straight position when said mode selector device is returned to conventional steer position, regardless of the positions of said steering wheel and of said front wheels.

3,856,103

IMPACT-ABSORBING INSTRUMENT PANEL FOR VEHICLES

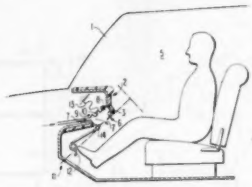
Hansjurgen Scholz, Echterdingen; Luigi Brambilla, Sindelfingen, and Rudolf Allgaier, Nagold, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed Oct. 16, 1972, Ser. No. 297,848

Claims priority, application Germany, Oct. 16, 1971, 2151599

Int. Cl. B60r *21/04*

U.S. Cl. 180—90 **22 Claims**



1. An impact-absorbing instrument panel for vehicles comprising

a base instrument panel structure in facing relationship to a vehicle interior space, said instrument panel structure being provided with shock-absorbing materials; and

a deformation means for protecting knees of vehicle passengers upon impact with said instrument panel structure,

said deformation means being a hollow bearer member having a rounded profile portion in facing relationship with the knees of vehicle passengers, and

said deformation means being provided at said instrument panel structure within an area of impact of the vehicle passenger knees with said instrument panel structure, said deformation means extending approximately over the entire vehicle width.

3,856,104

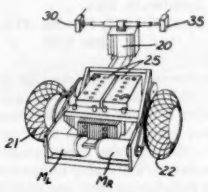
SEQUENTIAL CONTROL CIRCUIT FOR A REMOTE-CONTROLLED VEHICLE

Shunjiro Ohba, 5969 N. Elston Ave., Chicago, Ill. 60646

Filed July 7, 1972, Ser. No. 269,748

Int. Cl. B60k *27/00;* **B64c** *13/18*

U.S. Cl. 180—98 **8 Claims**



1. In a remote-controlled motor-driven vehicle responsive to a control signal transmitted by a portable transmitter carried by a moving individual for transporting a load at a predetermined distance behind said individual, an improved system for controlling said vehicle comprising:

means for receiving said transmitted signal and developing therefrom a range signal representative of the distance between said transmitter and said vehicle and a bearing signal representative of the heading of said vehicle relative to said transmitter;

controlling means responsive to said range and bearing signals for first steering the vehicle in the direction toward said transmitter and then moving the vehicle to said predetermined distance behind the transmitter.

3,856,105

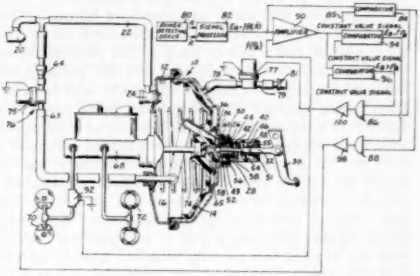
VEHICLE BRAKE SYSTEM HAVING FOOT PEDAL OPERATED BRAKE ACTUATOR WITH ELECTRONIC RANGE CONTROL

Richard L. Lewis, and George B. Hickner, both of 401 N. Bendix Dr., South Bend, Ind. 46628

Continuation-in-part of Ser. No. 293,301, Sept. 25, 1972, abandoned. This application Nov. 7, 1973, Ser. No. 413,484

Int. Cl. B60k *27/00*

U.S. Cl. 180—98 **10 Claims**



1. In an automotive vehicle brake system having a fluid pressure actuated motor including a housing with a movable wall therein dividing dividing the housing into opposed chambers and foot pedal operated valve means having a released position in which the fluid pressures in the opposed chambers are substantially the same and an applied position in which the fluid pressure in one of the chambers is greater than that of the other chamber so that the movable wall connected to a brake actuating means creates a braking force through the brake actuating means which is applied to the vehicle brakes, the improvement which comprises:

an electrical system including fluid pressure control means having an independent valve means connecting a low pressure fluid source and a relatively higher fluid pressure source to the fluid motor and an obstacle detecting device therein which generates a signal representative of the range of an obstacle for energizing the control means to regulate the fluid pressure in the one chamber with respect to that in the other chamber upon detecting an obstacle within a predetermined range in front of the vehicle so that the vehicle brakes are automatically applied independently of the released position of the foot pedal operated valve means.

3,856,106

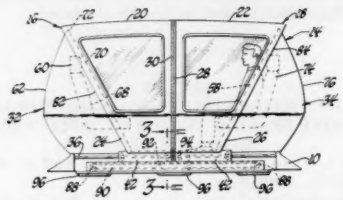
VEHICLE BODY CONSTRUCTION

Albert J. Sobey; Norman McQueen, and Robert R. Larsen, all of Bloomfield Hills, Mich., assignors to Otis Elevator Company, New York, N.Y.

Division of Ser. No. 167,016, June 28, 1972, Pat. No. 3,759,566. This application Nov. 27, 1972, Ser. No. 309,876

Int. Cl. B60v *1/18*

U.S. Cl. 180—116 **10 Claims**



1. A vehicle body comprising: a base portion having a horizontal floor surface; a track extending along each side of said base portion; at least one passenger seat fixedly mounted adjacent each end of said base portion with the seat at one end facing the seat at the other end and the space between said seats unobstructed; enclosure means cooperating with said base portion to define a passenger compartment therewith which encloses said seats; said enclosure means including a pair of movable sections; each of said movable sections having a top portion and a pair of integral side portions depending therefrom with the lower ends of said side portions slidably mounted on respective ones of said tracks; said movable sections having opposed inner edges and being movable along said tracks relative to each other between a closed position in which said opposed inner edges are engaged with each other such that the top portions cooperate to define at least a portion of the roof of said passenger compartment and said side portions cooperate to define at least a portion of the opposite side walls of said passenger compartment; said enclosure means further including a pair of end portions cooperating with said top and side portions to define spaced end walls for said passenger compartment; and support means on said base portion for movably supporting said base portion above a surface.

3,856,107

TOOLS FOR USE IN PERCUSSIVE MACHINES

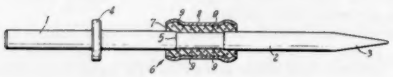
Reginald George Edward Rabett, Chesterfield, England, assignor to Robert D. Adams, Little Freys, Wrington and Ian J. Sharland, Chandlersford, Hints, both of, England

Filed Jan. 11, 1971, Ser. No. 105,588

Claims priority, application Great Britain, Jan. 21, 1970, 2957/70

Int. Cl. E21c *13/00*

U.S. Cl. 181—33 A **2 Claims**



1. A percussion tool assembly comprising:

a longitudinally extending stem,

a shank portion formed integrally with one end of said stem, a peripheral rib extending radially from said tool between said shank portion and the remainder of said tool, said rib for retaining the shank portion in a percussion apparatus, a working head at the other end of said stem,

and a collar assembly at the mid-point of the length of said tool, between the working head and the peripheral rib, said collar being fixed to said stem and comprising a mass of elastomeric material bound and compressed against the stem by metal sleeve means, said elastomeric material being additionally weighted with a higher density material embedded therein, said collar assembly for substantially inhibiting transverse vibrations of the tool.

3,856,108

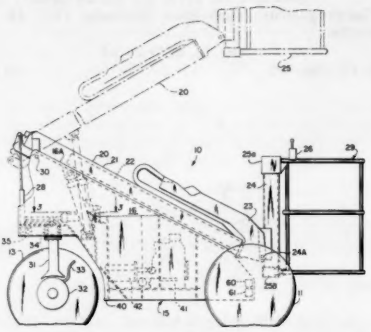
THREE WHEEL AERIAL PLATFORM APPARATUS

John L. Grove, McConnellsburg, Pa., assignor to Fulton Industries, Inc., McConnellsburg, Pa.

Filed May 25, 1973, Ser. No. 364,194

Int. Cl. B66f *11/04*

U.S. Cl. 182—16 **18 Claims**



1. A three wheel aerial platform apparatus comprising:

a chassis comprising a pair of spaced, substantially parallel and planar uprights,

said planar uprights each having substantially all of the structural material thereof in a vertical plane,

a wheel on the outside of each said upright at one end thereof, means on said uprights at said one end for supporting said wheels,

a single wheel at the other end of said uprights, means on said uprights at the said other end thereof for supporting said single wheel for steering movement,

a boom, means located generally above said single wheel for horizontally pivotally supporting one end of said boom on and between said uprights, said boom extending from said pivotal means in the direction of said first mentioned wheels, a workman's platform supported at the opposite end of said boom,

and means for moving said boom.

3,856,109

LADDER DEVICE

Robert B. Gates, Loraine, N. Dak.

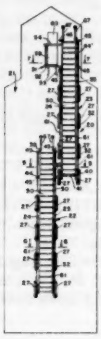
Filed Sept. 7, 1973, Ser. No. 395,121

Int. Cl. E06c *9/08*

U.S. Cl. 182—84 **2 Claims**

1. A ladder device for silos adapted to be mounted to a vertical wall of a silo, and comprising at least a pair of ladder sections, said ladder sections end each comprising a pair of vertically elongated railings adapted to be spaced outwardly from the silo wall with horizontal rungs connecting the railings together in fixed relation, a plurality of horizontally extending elongated spacing rods having their one ends fixed to opposite sides of the railings along the intermediate and lower ends of the railings and projecting inwardly toward the wall of the silo, vertically elongated plates mounted at the inner ends of the spacing rods, a plurality of vertically elongated C-shaped channels adapted to be fixed to the side of the silo, said elon-

gated plates being slidably mounted in said C-shaped channels to slide upward and downward in said channel so that the intermediate and lower ends of the railings may move up or down relative to the silo wall by the plates of the spacing rods moving up or down in the C-shaped channels, a pair of spacing rods at the upper end of said pair of railings on opposite sides of the railings with their one end fixed to the railings and their other end adapted to be fixed to the silo wall, a diagonal pair



of rods at the upepr end of said railings with their upper ends extending diagonally upwardly and adapted to be fixed to the silo wall at an angle in relation to said first pair of spacing rods to fix the upper end of the railings to the silo wall with all portions of the railings to the silo wall with all portions of the railings below the upper end portions and including the intermediate and lower portions being free to slide upward or downward relative to the silo wall by the sliding plate sliding in the C-shaped channels.

3,856,110

SHIPS ACCOMODATION LADDER

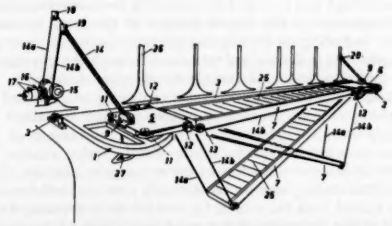
Per Nilsson, Vastra Frolunda, Sweden, assignor to AB Welin, Askim, Sweden

Filed Jan. 30, 1974, Ser. No. 437,918

Claims priority, application Sweden, Jan. 30, 1973, 7301236

Int. Cl. E06c *9/00*

U.S. Cl. 182—84 **7 Claims**



1. A ship's accomodation ladder comprising in combination two spaced platforms, about level with a deck of the ship and extendible outside the side thereof, a ladder portion extending between said platforms and having disengageable means at each end for forming, at will, a hinge connection with the adjacent platform, and a winch for operating wire means from the ship to one of the platforms, past the ladder portion to the other platform and back to the ship.

3,856,111

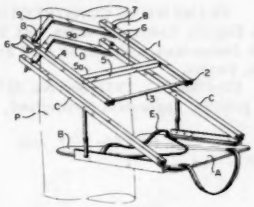
HAND CLIMBER ACCESSORY FOR TREE-CLIMBING-HUNTING PLATFORMS

James E. Baker, 2202 Pinecliff Dr., Valdosta, Ga. 31601

Filed Apr. 16, 1974, Ser. No. 461,357

Int. Cl. E04g *3/10*

U.S. Cl. 182—135 **4 Claims**



1. In combination with a tree climbing platform for hunters or the like of the type having a base plate adapted to be positioned substantially horizontally against a tree or pole, and having a blade extending from its rear edge adapted to bite into the tree, and having angularly disposed frame members extending upwardly and rearwardly beyond the blade from pivots adjacent the front end of the plate, and having a member removably secured to the rear ends of the frame members adapted to engage the opposite side of the tree from the blade, and having a foot strap on the plate adapted to overlie the feet of the hunter; a hand climber accessory for said platform adapted to be positioned on said tree or pole above the said platform, comprising spaced bars adapted to embrace said tree or pole therebetween; front and rear blades mounted on the bars for biting into the opposite sides of the tree or pole; and a hand grip tube fixedly mounted on at the front end of the bars above the platform, whereby a hunter standing on the platform with his feet engaged in the foot strap and with his hands gripping the tube of the accessory may alternately step-by-step first adjust the elevation of the hand climber with respect to the platform, and then by hanging from the tube, raise or lower the platform by merely lifting and lowering his feet to first disengage and then re-engage the platform with respect to the tree or pole at a different elevation.

3,856,112

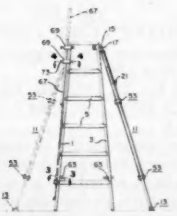
SAFETY ACCESSORIES FOR LADDERS

Arthur H. Stewart, 4487 Hillsborough Dr., Castro Valley, Calif. 94546

Filed Aug. 31, 1971, Ser. No. 176,504

Int. Cl. E06c *1/22*

U.S. Cl. 182—172 **5 Claims**



1. Safety accessory for a ladder having side rails and interconnecting rungs, comprising a stabilizing bar assembly in-

cluding a stabilizing bar and having a ground engaging end, and means at its other end for attaching same to one of the side rails of such ladder, said ground engaging end including a ground pad, a universal pin extending from the lower end of said stabilizer bar and connecting with said ground pad to permit of said ground pad conforming to slope deviations in all directions, and compression spring means installed between said ground pad and the proximate end of said stabilizer bar to render said stabilizer bar assembly substantially non-affected by normal sway movements of a ladder while in use.

3,856,113

FRAMEWORK CONSTRUCTION

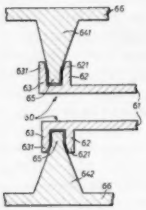
Erik Arne Engvall, Vasteras, Sweden, and Thomas Ritscher, Adliswil, Switzerland, assignors to AB Carl Keijser & Co., Vasteras, Sweden

Filed Nov. 17, 1972, Ser. No. 307,503

Claims priority, application Switzerland, Nov. 23, 1971, 17018/71

Int. Cl. E06c *1/02, 7/08*

U.S. Cl. 182—194 **21 Claims**



1. A ladder comprising two longitudinal beams made of an extrudable light metal alloy disposed in a substantially parallel alignment, said beams having a generally H-shaped cross-section in the form of a pair of legs joined by a web, wherein the web includes a central area of substantially uniform thickness, and a pair of lateral areas, each such lateral area being of gradually increasing thickness in a direction away from said central area; the central area of the web having a plurality of openings therein; a plurality of equidistanced hollow struts made of an extrudable light metal alloy arranged substantially normal to and interconnecting said beams and having a generally rectangular cross-section; and opposite end portions of said struts being received in the openings in said web, each strut end portion being provided with a pair of flanges formed wedgingly to interlock with the central area and abut a portion of said lateral areas of the web of the beam adjacent said strut end portion.

3,856,114

AUTOMATIC LUBRICATION SYSTEM

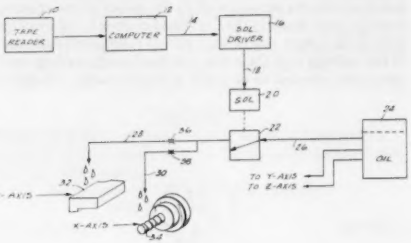
Frank Zankl, Milwaukee, Wis., assignor to Kearney & Trecker Corporation, West Allis, Wis.

Filed Jan. 29, 1973, Ser. No. 327,418

Int. Cl. F01m *1/00;* **F16n** *17/06, 29/00*

U.S. Cl. 184—6.1 **6 Claims**

1. A method of automatically lubricating a drive of a machine tool comprising the steps of determining the feed-rate of said drive by reading a record that is connected to control the operation of said drive, periodically adding a quantity to a counter in response to said reading which quantity bears a linear relation to the feed-rate of said drive as read from said record, and operating a valve in a conduit interconnecting a source of lubricant with said drive for a predetermined time interval each time said counter overflows whereby the lubricant is made available to said drive at substantially the same



time that the drive is being activated in response to the data from said record.

3,856,115

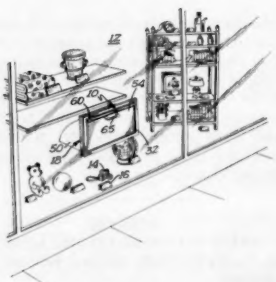
MARKETING DEVICE

Frank J. Stangel, Bloomington, Minn., assignor to Fingerhut Corporation, Minnetonka, Minn.

Continuation of Ser. No. 274,873, Aug. 21, 1972, abandoned. This application Aug. 16, 1973, Ser. No. 388,932

Int. Cl. E04h *3/04*

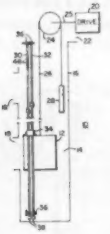
U.S. Cl. 186—1 R **23 Claims**



1. A device for marketing retail products on display in a display window of a retail sales establishment to consumers viewing such products through the display window without the necessity of the presence of sales personnel, both during the normal business hours of such retail establishment and after the normal business hours of such retail establishment, comprising in combination: a frame member having an aperture therethrough and arranged for mounting the marketing device in an aperture in the display window of the retail establishment, including: a rectangular portion having an aperture therethrough and arranged to extend through the aperture in the display window; an outside lip member attached to the rectangular portion exteriorly of the display window and arranged to overlap the display window around and about the display window aperture for preventing movement of the frame member toward the inside of the display window; an inside lip member attached to the rectangular portion interiorly of the display window substantially overlying and horizontally spaced from the outside lip member for preventing movement of the frame member toward the outside of the display window; and means mounted on the inside lip member for reducing the spacing between the inside lip member and the outside lip member to thus compress portions of the display window between the inside lip member and the outside lip member for supporting the marketing device upon such display window; a mechanism for recording the sale of the retail

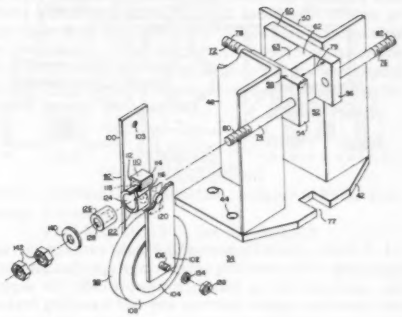
products to the consumer for later shipment and billing by the retail establishment and for returning a receipt of the sale to the consumer; a movable enclosure, including: a substantially flat sale-recording mechanism supporting surface; means for interconnecting the supporting surface and the frame member to allow the supporting surface to move from a closed position with the supporting surface substantially inside of the frame member to an open position with the supporting surface at least partially outside of the frame member to expose the sale-recording mechanism and the remainder of the enclosure to a purchaser positioned outside of the display window; an uncompleted order form compartment arranged within the enclosure, the compartment having an open end for providing the consumer ready access to any order forms in the compartment with the enclosure in the open position; a back wall attached to the supporting surface adjacent an edge of the supporting surface adjacent the interconnecting means and extending at substantially right angles to the supporting surface to substantially fill the aperture within the frame member in the open position of the enclosure, the dimensions of the back wall exceeding the dimensions of the aperture in the frame member and the display window for preventing the removal of the marketing device from the frame member; a completed order form compartment arranged adjacent the enclosure including an opening defined within the compartment allowing deposit of order forms completed by the purchaser, but preventing the withdrawal of completed order forms, and including a selectively removable portion to allow authorized access to the completed order forms.

3,856,116
ELEVATOR SYSTEM
Conwell Savage, New York, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Oct. 26, 1973, Ser. No. 410,155
Int. Cl. B66b *1/50*
U.S. Cl. 187—28 **19 Claims**



1. An elevator system, comprising:
a structure having a plurality of floors and a hoistway,
an elevator car,
means mounting said elevator car for movement in said hoistway to serve at least certain of said floors,
control means for said elevator car including an elongated member having first and second substantially opposed surfaces and first and second edges, a first cam member having a first cam profile thereon, and means mounting said first cam member on said elongated member in spaced relation relative to the first opposed surface and with the first cam profile oriented to move a cooperative cam follower in a direction substantially parallel with the first opposed surface,
means mounting the elongated member of said control means to extend along the hoistway of said structure in the direction of movement of said elevator car,
translating means including a first switch device having a cam follower and guide means,
and means mounting said translating means on said elevator car,
said guide means being disposed to guide said control means adjacent to said first switch device such that the cam follower of said first switch device is responsive to the first cam profile of said first cam member.

3,856,117
ELEVATOR SYSTEM
Frederick Solymos, Glen Ridge, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Sept. 25, 1973, Ser. No. 400,599
Int. Cl. B66b *7/04*
U.S. Cl. 187—95 **12 Claims**



1. A roller guide element for coacting with a guide rail to guide the movement of a movable element in a hoistway, comprising:
support means mountable on the movable element adjacent the guide rail, said support means including first, second and third shaft members extending outwardly therefrom, first, second and third roller assemblies of like construction mounted on said first, second and third shaft members, respectively,
each of said roller assemblies including a sleeve member, first and second guide rollers journaled for rotation relative to a common support structure, and means pivotally mounting said common support structure on said sleeve member,
said sleeve member defining a first opening for slidably guiding the sleeve member on its associated shaft member, and a communicating second opening of larger diameter adjacent the outwardly extending end of the shaft, providing a flat surface surrounding the first opening which is substantially perpendicular to the longitudinal axis thereof,
said sleeve member being slidable on its associated shaft member to adjustably accommodate different guide rail dimensions,
and means for adjustably preloading each of said roller assemblies against the guide surface of a guide rail including threads disposed on the outwardly extending end of each shaft member, a bias member disposed about each shaft member which extends into the second opening of said sleeve member, and means threadably engaged with each shaft member which is advanced on the shaft member to contact and compress the bias member against the flat surface surrounding the first opening of said sleeve member, said means which is threadably engaged with each shaft member providing positive stops beyond which the sleeve members cannot move.

3,856,118

BRAKE SYSTEM FOR A TRAVELLING BRAKE CARRIAGE OF AN AERIAL CABLEWAY

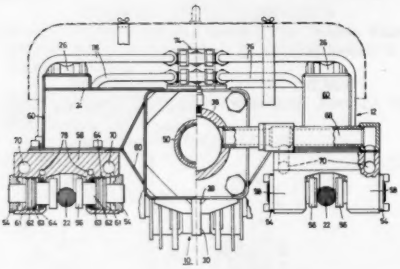
Fritz Feuz, Bern, Switzerland, assignor to Von Roll AG Werk Bern, Bern, Switzerland

Continuation-in-part of Ser. No. 118,395, Feb. 24, 1971, Pat. No. 3,722,632. This application Feb. 20, 1973, Ser. No. 333,696

Claims priority, application Switzerland, Dec. 17, 1970, 18749/70

Int. Cl. B61h *9/02*

U.S. Cl. 188—42 **9 Claims**



1. A brake system for a travelling brake carriage operatively connected with a travelling support carriage of an aerial cableway equipped with at least one support cable for supporing said travelling support carriage and said travelling brake carriage, the improvement comprising said travelling brake carriage embodying a brake carriage body, a housing extending in the lengthwise direction of the travelling brake carriage, said housing being provided with a braking spring accumulator, a piston and cylinder arrangement operatively associated with said braking spring accumulator, said cylinder having a compartment containing a first braking fluid medium, said braking spring accumulator continually applying a braking force upon said first fluid medium via said piston and cylinder arrangement, at least one braking block supported by said brake carriage body, said braking block being provided with cooperating pairs of braking shoes, the shoes of each pair being arranged to respective opposite sides of the associated support cable, a respective double-acting piston member having first and second opposed faces acting upon each braking shoes, unobstructed means for transmitting the pressure of the first fluid medium within the piston and cylinder arrangement against said first face of each of said double-acting piston members and thereby against the braking shoes in a direction urging the latter into a braking position towards the associated support cable, and means for continually applying a counterforce against the braking shoes in a direction opposite to the urging force exerted by the first fluid medium of the piston and cylinder arrangement, said means for applying a counterforce including means for controllably feeding a second fluid medium at a pressure greater than the pressure of the first fluid medium against said second face of each of said double-acting piston members.

3,856,119

TRANSMISSION BRAKE MECHANISM

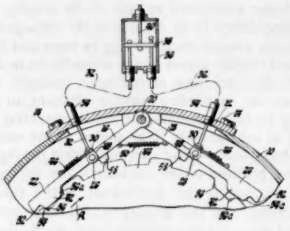
James A. Harrington, Mooresville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 382,007, July 23, 1973, abandoned. This application Oct. 15, 1973, Ser. No. 406,158

Int. Cl. F16d *63/00*

U.S. Cl. 188—82.3 **4 Claims**

1. A transmission brake mechanism for use in a transmission having a housing and an output shaft with a toothed element drivingly connected thereto, said mechanism comprising; a first link pivotally connected to the housing; a second link having a toothed portion intermediate the ends of said second link and fulcrum point means adjacent one end of said second link; means for pivotally connecting said second link and said first link; operating means for selectively moving said second link for engaging said tooth portion with said toothed element with said fulcrum point spaced from said toothed element and for disengaging said toothed portion from said toothed element; spring means for urging said first and second links into substantially a single plane in the engaged and disengaged position and for permitting relative pivotal movement between said links during disengagement; said fulcrum point means contacting said toothed element during disengagement for establishing said second link as a second class lever for providing assistance during disengagement of said toothed portion.



3,856,120

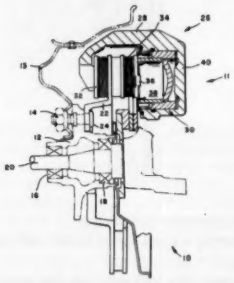
DISC BRAKE WITH SEMI-METALLIC AND ORGANIC FRICTION PADS

John P. Kwolek, and Patrick A. Thesier, both of Troy, N.Y., assignors to The Bendix Corporation

Filed Dec. 14, 1972, Ser. No. 315,262

Int. Cl. F16d *69/02*

U.S. Cl. 188—251 A **1 Claim**



1. A disc brake combination for use in a motor vehicle having a rotor means attached to a wheel and a stator means attached to a stationary portion of said vehicle adjacent the rotor means, said stator means comprising:

caliper means surrounding a first wear surface on one side and a second wear surface on another side of said rotor means, fluid receiving means responsive to a braking signal for moving said caliper means toward said first and second wear surfaces on the rotor means;

first pad means attached to said caliper means for engaging said first wear surface to create a first frictional resistance representative of said fluid signal, said first pad means consisting of a semi-metallic material having a composition of from 15–40 percent by volume of metal powder, 15 to 25 percent by volume of a metal fiber, 15–40 per-

cent by volume of a first phenolic resin, 2–10 percent by volume of a ceramic powder, 15–40 percent by volume of a graphite or carbon particles, and 15–20 percent by volume of an elastomeric modifier, said first phenolic resin being cured to form a binder for retaining said metal powder, metal fiber, ceramic powder, graphite or carbon particles and elastomeric modifiers in a fixed relationship; and

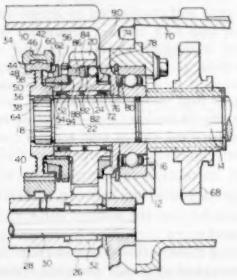
second pad means attached to said caliper means for engaging said second wear surface to create a second frictional resistance representative of said fluid signal, said second pad means consisting of an organic material having a composition of from 20–60 percent by volume of asbestos, 15–35 percent by volume of a second phenolic resin, 10–25 percent by volume of cashew nut powders, 3–15 percent by volume of elastomeric modifiers, 6–10 percent by volume of graphite or carbon, and 10–20 percent inorganic fillers, said second phenolic resin being cured to form a binder for retaining said asbestos and cashew nut powders in a fixed relationship, said first and second frictional resistances in the disc being combined to effectively produce a uniform coefficient of friction in response to said braking signal, said fluid receiving means will dissipate heat transmitted through said second pad means to maintain said uniform coefficient of friction in response to repetitive braking signals and to provide substantially equal wear with the first pad means, said first and second pad means upon heat generation during engagement with said rotor means because of said compositions will recover from a fade condition to permit a repetitive braking signal to re-establish said coefficient of friction.

3,856,121

SYNCHRONIZING DEVICE FOR MANUALLY OPERATED POWER TRANSMISSION MECHANISM

Keizaburo Usui; Eiichi Abe, and Isao Hayama, all of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Kanagawa-ku, Yokohama City, Japan

Filed June 11, 1973, Ser. No. 368,489
Claims priority, application Japan, June 13, 1972, 47-58767
Int. Cl. F16d *23/06*
U.S. Cl. 192—53 F **11 Claims**



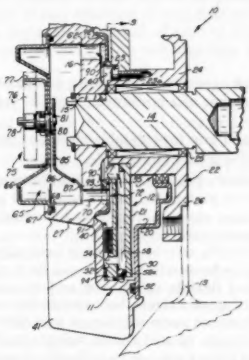
1. A synchronizing device particularly for a manually operated power transmission mechanism including a transmission mainshaft and a first speed gear rotatable on the mainshaft, which device comprises a synchronizer clutch hub rotatable with said mainshaft, a synchronizer clutch sleeve rotatable with and axially slidable on said synchronizer clutch hub, said synchronizer clutch sleeve having internal gear teeth and adapted to be axially moved from the outside of the synchronizing device, at least one locking member rotatable with and axially slidable on an inner peripheral wall of said synchronizer clutch sleeve, a synchronizer clutch gear located between said synchronizer clutch hub and said first speed gear and rotatable with and axially slidable on the first speed gear, said synchronizer clutch gear having a conical portion tapered toward said synchronizer clutch hub, a first baulk ring located between said locking member and said synchronizer clutch gear and having an inner conical surface matching said conical portion of said synchronizer clutch gear, said synchronizer clutch gear and said first baulk ring having external gear teeth which are in agreement with and located in line with said internal gear teeth of said synchronizer clutch sleeve, a synchronizer clutch ring located opposite to said synchronizer clutch gear across said first speed gear and rotatable with and axially slidable on the first speed gear, said synchronizer clutch ring having a conical portion which is tapered away from the first speed gear, a second baulk ring rotatable with the transmission mainshaft and having an inner conical surface matching said conical portion of said synchronizer clutch ring, thrust transfer means engageable at one end with said synchronizer clutch gear and at the other end with said synchronizer clutch ring across the first speed gear so that an axial pressure from the synchronizer clutch gear is transmitted to the synchronizer clutch ring when the synchronizer clutch gear is forced toward the ring speed gear, and resilient biasing means for urging said synchronizer clutch gear away from the first speed gear on the mainshaft.

3,856,122

VISCOUS COUPLING

Wayne K. Leichliter, Marshall, Mich., assignor to Eaton Corporaton, Cleveland, Ohio

Filed May 16, 1973, Ser. No. 360,629
Int. Cl. F16d *35/00*
U.S. Cl. 192—58 B **12 Claims**



1. A viscous coupling comprising relatively rotatable input and output coupling members,

said input coupling member defining a chamber in which at least a portion of said output coupling member is located, said input and output coupling members defining a shear space therebetween and viscous shear fluid in said shear space effecting the transmission of torque therebetween, means on said input member defining a fluid reservoir chamber,

an impact pumping element carried by said output member and against which fluid is impacted by rotation of said input member,

means defining a fluid passageway for directing fluid from adjacent said pumping element into said reservoir chamber,

passage means for directing fluid from said reservoir chamber back into said shear space,

valve means for controlling fluid flow through said passage means, and

ambient temperature-sensing means carried by said input member on an outer surface portion thereof for controlling said valve means.

3,856,123

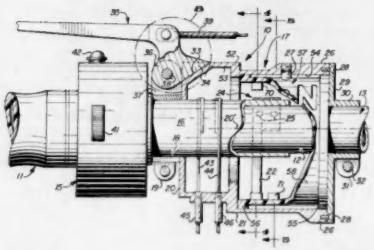
HANDLEBAR-MOUNTED CLUTCH ACTUATING AND GEAR SHIFTING DEVICE FOR MOTORCYCLES

Lewis R. Kinsey, 108 S. 25th St., Phoenix, Ariz. 85034

Filed Dec. 11, 1973, Ser. No. 423,695

Int. Cl. F16h *5/36*

U.S. Cl. 192—3.62 **6 Claims**



1. A clutch actuating, gear shifting mechanism for mounting on the handlebar of a motorcycle and like handlebar devices comprising:

a twist hand grip for rotatably mounting around the end of a handlebar of a motorcycle,

a first hollow cylindrical casing fixedly mounted around the handlebar juxtapositioned to said hand grip,

said cylinder casing having a V-shaped depression formed in its outer periphery,

a sleeve fixedly attached to and in axial alignment with said hand grip for rotation within said first cylindrical casing, a pair of flexible cables one end of each being fixedly attached to said sleeve for rotation therearound in opposite directions upon rotation of said sleeve,

the other ends of said cables being attached to opposite ends of a lever arm which is fixedly attached to the rotating shaft of a gear shifting mechanism,

a clutch lever being spring biased for placing a protrusion thereof into said depression in the outer periphery of said sleeve for detachably positioning said hand grip relative to said first cylindrical casing,

means for attaching one end of a clutch cable to one end of said clutch lever for actuation of said clutch cable whenever said clutch lever is rotated,

a second hollow cylindrical casing rotatively mounted within said first cylindrical casing,

means for selectively engaging said second casing with and rotated by said sleeve upon rotation of said hand grip,

said second casing being provided with a plurality of indicia spaced around at least a part of the periphery of said second casing indicating the position of the gear mechanism of the associated motorcycle, and

a window opening extending through said first casing in position for exposing one of said indicia indicating the position of the gear mechanism of the motorcycle.

3,856,124

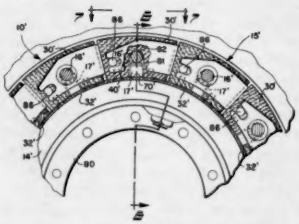
COUNTERWEIGHTED TORQUE TRANSMITTING MECHANISM

Raymond E. Mack, Rocky River; Kiritkumar R. Patel, and Edward C. Crist, both of Brooklyn, all of N.Y., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 24, 1973, Ser. No. 363,686

Int. Cl. F16d *25/04*

U.S. Cl. 192—88 B **10 Claims**



1. A torque transmitting device for coupling relatively rotatable first and second assemblies to one another, said device including a first assembly having a relatively rotatable frame; said frame being generally cylindrical and U-shaped in cross sectional configuration, said frame including first and second circular side plates and an annular rim secured therebetween, coupling means disposed for radial movement with respect to said frame for engaging said second relatively rotatable assembly, said coupling means including a plurality of shoe assemblies circumferentially spaced in equal increments around said frame, each shoe assembly being defined as an arcuately-extended segmented shoe block and a facing of friction material is secured to said shoe block, each assembly further having a central opening axially extending therethrough, actuating means engaging said coupling means to cause said radial movement thereof and a counterweight arrangement for said device, said counterweight arrangement comprising:

mounting means affixed to said frame, said mounting means including a torque bar extending through said opening and secured at its ends to the sides of said frame;

a first and a second counterweight pivotable about said mounting means and configured to define a forward end extending on one side of said mounting means and a rearward end extending on the opposite side of said mounting means, said forward ends exerting greater leverage about said mounting means than said rearward ends when said first assembly is rotating, said first counterweight having its forward end extending in a direction opposite said forward end of said second counterweight, each counterweight having an opening axially extending therethrough to receive said torque bar whereby each counterweight is positioned between an axial end face of said shoe assembly and the interior surface of one of said side plates; and

force transmitting means affixed to said coupling means and operatively engaged with said rearward end of said counterweight to exert said leverage on said coupling means whereby said counterweight exerts a force tending to counteract the undesirable effects of centrifugal force exerted by said coupling means.

3,856,125

PRINTING MACHINE WITH OPERATION LOCKOUT

Donald Saxton Post, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

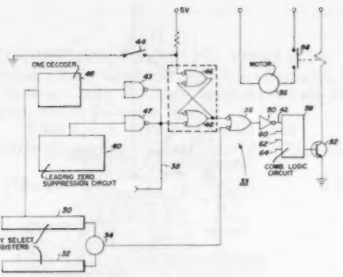
Filed Mar. 19, 1973, Ser. No. 342,638

Int. Cl. G11c *19/00;* **H03k** *21/32;* **B65h** *7/00*

U.S. Cl. 192—127 **5 Claims**

1. In a copying machine, the combination comprising:

a. means for registering the number of copies that it is desired be made of an original document; and



b. means for sensing any number registered by said registering means, and for preventing actuation of said machine if said registered number lies within a predetermined range.

3,856,126

COIN OPERATED APPARATUS

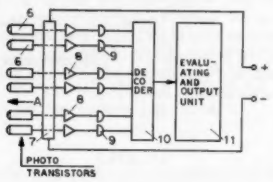
Wilhelm Menke, Bingen, Germany, assignor to NSM Apparatebau GmbH Kommanditgesellschaft, Bingen, Germany

Filed Apr. 5, 1973, Ser. No. 348,222

Claims priority, application Germany, Apr. 7, 1972, 2216635

Int. Cl. G07f *9/00*

U.S. Cl. 194—1 R **13 Claims**



1. In a coin operated apparatus which indicates a winning wherein game feature carriers are freely movable within predetermined boundaries in the apparatus, wherein a sensing area is provided for receiving said game feature carriers, wherein sensing means are arranged for sensing said game feature carriers when they are in said sensing area, and wherein said sensing means are connected to evaluating means for controlling an output in response to sensing said game feature carriers, the improvement comprising a plurality of game feature carriers at least several of which are provided with a plurality of differently reflecting surfaces, light source means arranged to illuminate said differently reflecting surfaces when said game feature carriers are in said sensing area, light sensitive sensing means arranged to receive light reflected from a plurality of said differently reflecting surfaces of each of said several carriers, and circuit means for connecting said light sensitive sensing means to said evaluating means.

3,856,127

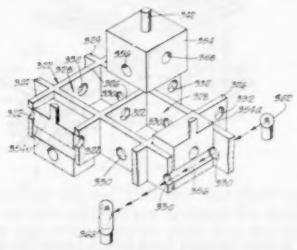
PHOTO-OPTICAL KEYBOARD

Uri Halfon, 3200 South Sepulveda, Los Angeles, Calif. 90034, and Meir Niv, 611 N. Curson Ave., Los Angeles, Calif. 90036

Filed Nov. 24, 1972, Ser. No. 309,186

Int. Cl. B41j *5/08*

U.S. Cl. 197—98 **14 Claims**



1. A photo-electric keyboard apparatus comprising:

a block member;

means defining a first set of substantially parallel channels in one surface of said block member; each of said channels having a bottom surface;

means defining a second set of substantially parallel channels in said one surface of said block member; each of said channels of said second set having a bottom surface; each of said channels of said second set extending at an angle to each of said channels of said first set;

a light source disposed at one end of each of said channels of said first and second sets for radiating light through the channel;

a light sensitive device disposed at the other end of each of said channels of said first and second sets for receiving light radiated through the channel from said light source at the said one end of the channel;

said channels of said first set extending deeper into said one surface of said block member than said channels of said second set;

a plurality of shutter assemblies operatively associated with said block member for selectively intercepting the light radiation in selected channels;

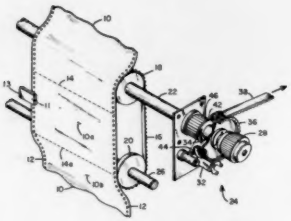
each of said shutter assemblies comprising first and second shutter members spaced from one another and extending substantially parallel to one another; means connecting said first and second shutter members for conjoint movement; said first shutter member being adapted to be received by one of said channels of said first set of channels; said second shutter member being adapted to be received by one of said channels of said second set of channels; each of said first and second shutter members having an outer end; said outer end of said first shutter member extending beyond the outer end of said second shutter member; spring means biasing said first and second shutter members to an inoperative position wherein said outer end of said first shutter member is spaced from the bottom surface of said one channel of the first set of channels and said outer end of said second shutter member is spaced from the bottom surface of said one channel of the second set of channels; and finger operable means for depressing said first and second shutter members simultaneously to move the outer ends of said first and second shutter members into close proximity with said bottom walls of said one channel of said first set and said one channel of said second set, respectively, to substantially block light from radiating through said respective channels.

3,856,128

PRINTER VARIABLE FORM LENGTH CONTROLLER

James A. Taggart, Salt Lake, Utah, assignor to Sperry Rand Corporation, New York, N.Y.

Filed Sept. 20, 1973, Ser. No. 399,230
Int. Cl. B41j *15/04*
U.S. Cl. 197—133 R **6 Claims**



1. A printer variable form length controller providing line advance signals for advancing a paper web upon which characters are to be printed, comprising:

line advance gating means for providing a line advance signal output when enabled;

means for coupling timing signals as the first input to said line advance gating means;

a skip counter;

means for coupling the line advance signal output from said line advance gating means to said skip counter for counting said line advance signals;

a skip flip-flop;

means for coupling the output of said skip counter as a first input to said skip flip-flop;

means for coupling a first output of said skip flip-flop as the second input to said line advance gating means;

set switch means coupled to the second input of said skip flip-flop for enabling said line advance gating means to couple said line advance signals to said skip counter to toggle said skip counter to a predetermined skip count and then to toggle said skip flip-flop and to disable said line advance gating means.

3,856,129

APPARATUS FOR AUTOMATICALLY FEEDING CRT FACE PANELS TO A PANEL PROCESSOR

Leslie L. Baur, Glen Ellyn, and Thaddeus J. Hajduk, Chicago, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

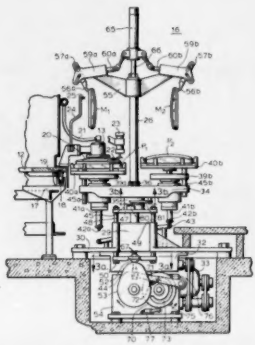
Filed Jan. 30, 1973, Ser. No. 327,916
Int. Cl. B23q *7/00*
U.S. Cl. 198—19 **9 Claims**

1. Apparatus for automatically inserting and retrieving cathode ray tube face panels from a panel processor, said processor including a programmer, an endless conveyor carrying a plurality of panel supporting carts and a prime mover, controlled by said programmer for stepping said carts through a series of work stations, including an index station, disposed along a closed path, said apparatus comprising:

a platen having a plurality of panel holders successively displaceable between said index station and a loading station;

means for effecting a first reciprocation of at least that one of said panel holders instantaneously located at said index station into cooperative engagement with a first indexed one of said carts for inserting an unprocessed panel in said first cart and for thereafter effecting at said second station a second reciprocation of said one panel holder into cooperative engagement with a subsequently indexed cart for retrieving a processed panel from said subsequent cart;

and platen driving means for displacing said one panel holder and said retrieved processed panel to said loading station while simultaneously displacing another of said



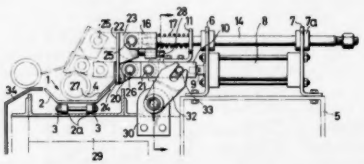
panel holders carrying an unprocessed panel to said index station for insertion into said subsequently indexed cart by said reciprocation means.

3,856,130

APPARATUS FOR REMOVING PIPES FROM A CONVEYOR

Kazuo Maeda; Muneto Takizawa, both of Chibaken, and Yuzi Saito, Kanagawaken, all of Japan, assignors to Mitsui Shipbuilding and Engineering Co., Ltd., Tokyo, Japan

Filed May 24, 1973, Ser. No. 363,505
Claims priority, application Japan, May 29, 1972, 47-53082
Int. Cl. B65g *47/34*
U.S. Cl. 198—24 **3 Claims**



1. Apparatus for removing a pipe from a conveyor in response to a cycle of motion of a linearly-reciprocating piston, comprising:

connecting means secured to said piston to reciprocate linearly therewith;

bar means mounted to be reciprocable for a predetermined distance along an axis parallel to the direction of reciprocation of said connecting means;

spring means acting between said connecting means and said bar means and responsive to forward motion of said connecting means toward the position of a pipe to move said bar means forwardly to substantially the same extent as said connecting means, over a predetermined distance;

stop means for arresting said forward motion of said bar means at a predetermined position before said connecting means has completed its forward stroke, said connecting means continuing its forward stroke thereafter with attendant deflection of said spring means;

link means comprising two pivot means, one of said pivot means pivotally connecting said link means to said connecting means; and

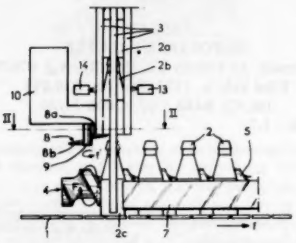
pipe-removing plate means pivotally mounted to the other of said pivot means and also pivotally secured to said bar means, whereby said plate means moves linearly for a predetermined distance during the initial portion of the forward stroke of said piston, and moves both forwardly and angularly in a smooth predetermined scooping motion during the latter position of said forward stroke.

3,856,131

LOADING AND CONVEYING APPARATUS

Guy Flamand, Chalon Sur Saone, and Henri Lazzarini, Saint-Denis-En-Bugey, both of France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Apr. 5, 1972, Ser. No. 241,188
Claims priority, application France, Apr. 7, 1971, 71.12370
Int. Cl. B65g *47/00*
U.S. Cl. 198—26 **8 Claims**



1. Loading and conveying apparatus comprising a horizontal conveyor, means to position objects on the conveyor comprising a rotary shaft mounted above and to one side of the conveyor and having a spiral land bounding a spiral groove, the latter being large enough and deep enough to partially embrace objects, means to load objects onto the conveyor and into the groove in sequence as successive portions of the groove reach the loading means, the latter comprising vertically arranged guide means above the conveyor and means for supporting objects in said guide means for releasing the same one by one to drop from the guide means onto the conveyor and into the section of the groove below the guide means, means to detect the presence of the groove section below the guide means, and means responsive to said detection means to effect actuation of said supporting means to release an object to drop from the guide means and to thereafter engage the succeeding object for supporting the same.

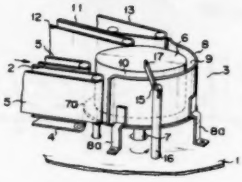
3,856,132

APPARATUS FOR CONVEYING SHEET MATERIALS

Masayuki Sakurai, Tokyo; Syozo Takahashi, and Hideo Kikuno, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Saiwai-ku, Kawasaki-shi, Japan

Filed July 7, 1972, Ser. No. 269,578
Claims priority, application Japan, July 8, 1971, 46-59816
Int. Cl. B65g *47/30*
U.S. Cl. 198—30 **4 Claims**

1. Apparatus for conveying sheet materials comprising a vertical rotary drum, a guide frame disposed about one half of the periphery of said rotary drum to define a gap therebetween extending in parallel with the periphery of said rotary drum, a rotary table extending outwardly from the lower end of said rotary drum to close the bottom of said gap, a supply conveyor driven in the same direction as the direction of rotation of said rotary table for conveying said sheet materials in the upright condition, said supply conveyor having a discharge end disposed close to the entrance end of said guide frame, and a takeoff conveyor driven in the same direction as the direction of rotation of said rotary table for conveying said sheet materials discharged from said gap in the upright condition, said takeoff conveyor having an inlet end disposed close to the discharge end of said gap and comprising an outside belt having an inner surface disposed in substantially the same plane as the inner surface of said guide frame at the exit end thereof and an inside belt driven in the same direction at a higher speed as said outside belt, said outside and inside belts



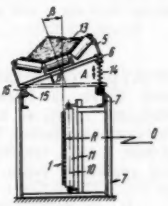
cooperating to take off, one after one, said sheet materials discharged from said gap, said gap reversing the direction of movement of said sheet materials while they are conveyed therethrough and having a radial width sufficient to permit overlapping of a plurality of sheet materials for the sake of temporarily buffering them while they are conveyed therethrough in the upright condition.

3,856,133

ENDLESS BELT CONVEYOR

Vladimir Konstantinovich Dyachkov, ulitsa Chkalova, 41/2, kv. 1, Moscow, U.S.S.R.

Filed Dec. 26, 1972, Ser. No. 318,276
Int. Cl. B65g *15/28*
U.S. Cl. 198—182 **3 Claims**

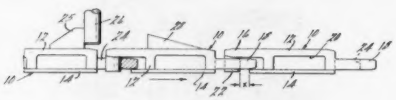


1. An endless belt conveyor having a path which has rectilinear and curvilinear sections disposed in a horizontal plane, said conveyor comprising: a frame; bearers uniformly distributed the length of said frame and mounted on said frame; idlers mounted in said bearers; an endless belt having load carrying and return strands which are supported by said idlers; the idlers which support said return strand of said endless belt in said curvilinear sections of the conveyor path being positioned with their axes extending vertically so as to permit a decrease in the radius of turn of said return strand of said endless belt in said curvilinear section of the conveyor path; the idlers which support said return strand of said endless belt in the transition portion of the conveyor path between said rectilinear and curvilinear sections thereof being positioned so as to have their axes inclined to the horizontal, the inclination angle of the idlers progressively increasing from zero to 90°, whereby said endless belt is gradually turned from a horizontal into a vertical position; and said bearers with said idlers mounted therein to support said load carrying strand of said belt within said curvilinear sections thereof being disposed so as to be inclined away from the center of the curvilinear section of the conveyor path.

3,856,134
CONVEYOR CHAIN

Robert Krammer, Farmington, Mich., assignor to Jorgen S. Bildsoe, St. Paul, Minn.; Robert Krammer, Farmington and Myron B. Brookfield, Birmingham, both of, Mich., part interest to each

Filed Dec. 13, 1971, Ser. No. 207,471
Int. Cl. B65g *17/06*
U.S. Cl. 198—189 **9 Claims**

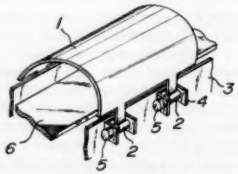


1. A conveyor chain comprising a plurality of identical links articulated together, each of said links comprising a longitudinally extending body portion having adjacent one end first means defining an opening and adjacent the opposite end second means defining a first projection, the axis of said first projection being disposed generally parallel to the axis of said opening, said first projection on each link being pivotally receivable within said opening in the immediately adjacent link, and locking means for preventing removal of each said first projection from the opening in which it is disposed except when the longitudinal axes of the respective immediately adjacent links are positioned at approximately right angles with respect to one another in a plane perpendicular to the axis of said opening, said locking means comprising means on each said link defining a second projection adjacent said first projection, said second projection being spaced from said first projection a distance less than the distance between said opening and the free end of said first means so that said second projection will engage said first means on said immediately adjacent link and prevent such removal except when said immediately adjacent links are in said position.

3,856,135
CONVEYOR COVER ASSEMBLY

Masaya Hayakawa, Tokyo; Iki Harada, Yokohama, and Fumiyoshi Yamagami, Tokyo, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Sept. 7, 1973, Ser. No. 396,275
Claims priority, application Japan, Sept. 11, 1972, 47-105080[U]; Sept. 11, 1972, 48-57321
Int. Cl. B65g *21/08*
U.S. Cl. 198—204 **3 Claims**

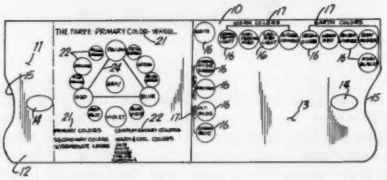


1. A conveyor cover assembly comprising a plurality of cover plate members, each having a pair of substantially rectilinear parallel edge portions and a raised covering surface extending between the two edge portions, each edge portion having at last one leg extending downwardly in a direction substantially opposite to the direction in which the covering surface is raised, said leg having a hinge hole extending therethrough in parallel to said edge portion; a plurality of brackets, one for each said leg, said bracket having parallel end walls defining a leg-receiving space therebetween, each said end wall having a shaft hole; and hinge shafts which are detachably mounted in the brackets so as to pivotally connect said legs to the brackets by extending through said shaft holes of the bracket and said hinge hole of the leg disposed in said leg-receiving space of the bracket, each consisting of a rod having a fixed head secured to one end thereof and a resiliently deformable enlarged portion secured to the opposite end thereof, said fixed head having a dimension at right angles to the longitudinal direction of the rod, which dimension is large enough to inhibit passage of the fixed head through said shaft hole of said bracket end wall, said enlarged portion normally assuming a dimension at right angles to the longitudinal direction of the rod, which dimension is large enough to inhibit passage thereof through said shaft hole of the bracket end wall and said hinge hole of said leg, but said enlarged portion being deformable to a smaller dimension for allowing passage thereof through said shaft hole of the bracket end wall and the hinge hole of said leg.

3,856,136
DISPOSABLE PALETTE

Sandi Governale, 13 Tenafly Ct., Tenafly, N.J. 07670

Filed Feb. 6, 1973, Ser. No. 330,091
Int. Cl. B44d *3/02;* **G09b** *11/10*
U.S. Cl. 206—1.7 **1 Claim**



1. A book of disposable palette sheets, each shaped in the form of a painter's palette having a through thumb hole, and a concave recess positioned along the adjacent edge near the thumb hold for ease in grasping the palette, with each sheet of the book fastened so as to be readily individually detached, and with each sheet marked into individual sections which are each labeled with the name of a color of the pigment that is to be placed in that section, and with each group of markings of similar colors linked together and identified as to their similarity, with

the labeled sections for placement of the cool colors such as cobalt blue, ultramarine blue, viridian and chrome oxide green located adjacent to each other and labeled cool colors, with

the labeled sections for the placement of the warm colors such as cadmium yellow light, cadmium yellow medium, cadmium red light and alizarine crimson placed together and labeled warm colors, and the sections for locating earth colors, such as yellow okra, indian red, burnt umber, raw umber and ivory black placed together and labeled as earth colors, together with

a cover sheet which is permanently attached to the binder of the book, with the inside face of the cover sheet marked with information to indicate the mixing of the primary colors and to indicate the secondary colors which are formed by mixing each pair of primary colors, with individual sections, each labeled with the name of a color, located on the circumference of the circle, with the sections marked with the name of the secondary colors formed, by combining each pair of the primary colors shown, located on the circle between that pair of sections labeled with the names of those particular primary colors.

3,856,137

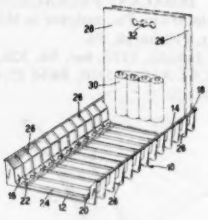
DISPLAY TRAY WITH MERCHANDISE-MOUNTED CARD PACKAGES

Robert E. Brindley, New York, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 120,698, March 3, 1971, abandoned, which is a continuation of Ser. No. 765,852, Oct. 8, 1968, abandoned. This application Dec. 29, 1972, Ser. No. 319,531

Int. Cl. B65d *1/36*

U.S. Cl. 206—73 **2 Claims**



1. In combination a plurality of cards having merchandise-mounted thereon, and a tray for supporting and displaying said cards in an erect position, said tray being fabricated from a thin, thermoplastic resin material and having a generally rectangular bottom, a pair of upstanding side walls, an open end and an upstanding end wall at the other end, said walls being integral with said bottom; a plurality of ribs formed in said side walls and extending externally thereof so as to buttress said side walls, said ribs providing slots in each side wall with the slots in one side wall being opposite and registering with the slots in the other side wall so that the cards having merchandise mounted thereon are inserted into opposite slotted ribs and held therein in an erect position; the height of said side walls being less than the height of the inserted cards so that said cards can be displayed in said tray; a plurality of longitudinal ribs in the bottom of said tray close to each of said side walls to resist longitudinal bending of said tray; a plurality of transverse ribs in said bottom to resist transverse bending of said tray so that said transverse ribs and said longitudinal ribs cooperate to resist twisting of said tray; and wherein said longitudinal ribs and transverse ribs are disposed in a concave-convex arrangement wherein the ribs in one direction are concave and the ribs in the other direction are convex.

3,856,138

COMPARTMENTALIZED CONTAINER

Hideyuki Maekawa, Osaka, and Masaichi Nakanishi, Amagasaki, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed May 31, 1973, Ser. No. 365,696

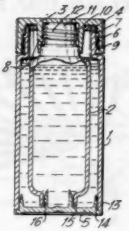
Int. Cl. B65d *25/02;* **B01f** *13/00;* **A61j** *1/00*

U.S. Cl. 206—221 **6 Claims**

1. A compartmentalized container for storing, mixing and dispensing liquids which must be segregated prior to use, which comprises in combination;

an outer and an inner cylindrical side wall components each having an open bottom end disposed concentrically with respect to the other such that both of said open bottom ends are substantially in a plane, said outer side wall component having a mouth at its top with a fastening screw and said inner side wall component having a closed top end with a fastening screw extending therearound, the threading-in direction of which screw being in reverse to that of the first-mentioned screw,

a bottom plug stopping said open bottom ends in common, a closure cap means having a fastening means engageable with the fastening screw of said mouth of the outer side wall component and another fastening means engageable with the fastening screw of said closed top end of the inner side wall component, and



an annular sealing member being placed between the closure cap means and the mouth of the outer cylindrical side wall component.

3,856,139

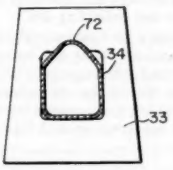
CARRIER MEANS FOR AUTOMATICALLY DRIVEN FASTENERS

Hugh Black, c/o Woodloc Incorporated, Liner Cove Rd. Box 556, Waynesville, N.C. 28786

Continuation-in-part of Ser. No. 869,837, Oct. 27, 1969, Pat. No. 3,693,863. This application Sept. 8, 1972, Ser. No. 287,542

Int. Cl. B65d *79/00*

U.S. Cl. 206—340 **4 Claims**



1. The combination of an apertured fastener for securely joining material sections together and a flexible carrier tube for holding a plurality of said apertured fasteners used in fitting the fasteners onto automated drive tools

said fastener comprising a body section having a leading end and a trailing end,

a peripheral wall depending from each side of said body section to form a channel-like unit,

said body section having a centrally located aperture therein.

said aperture being generally rectangular in shape having three substantially straight sides,

the fourth side of said aperture including a centrally located arcuate extension of the main aperture, and

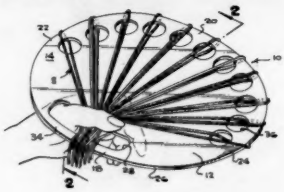
said carrier tube conforming to said generally rectangular shaped aperture with said extended portion so as to be contiguous with all sides of said aperture including the extended portion,

the extended portion facilitating mounting said fasteners on the carrier and preventing the fasteners from jamming on said carrier while being driven from said automated drive tool.

3,856,140
YARN PALETTE

Jane W. Fitts, 4245 Brookdale St., Jackson, Miss. 39206

Filed Apr. 2, 1973, Ser. No. 346,937
Int. Cl. B65b 85/67; B65h 75/06
U.S. Cl. 206—388 1 Claim



1. A strand separator for maintaining a plurality of strands of material in orderly condition during operations involving selected employment of different strands, the strand separator comprising:

a palette body of elongated, flat form having upper and lower surfaces, inner and outer sides, and ends;

the palette body being formed of a transparent material permitting viewing of the condition of the strands on both surfaces thereof;

the palette body having a peripheral edge extending about said sides and ends;

the palette body having an elongated finger and strand collecting slot formed therein and extending therethrough from its upper surface to its lower surface, the finger and strand collecting slot being located adjacent the peripheral edge of the inner side of the body;

the palette body having a plurality of individual strand openings therein adjacent the peripheral edge of the outer side thereof, said individual strand openings extending fully through the body, and individual strands being extended through said openings and collected together at the finger and collecting slot;

the peripheral edge being curvilinear;

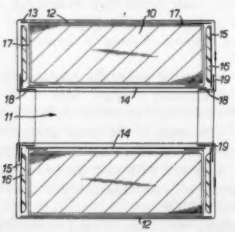
the finger and collecting slot being curved and being centrally located with respect to the strand openings; and

the plurality of individual strand openings being arranged in a series equidistantly spaced from the adjacent peripheral edge and uniformly spaced from one another.

3,856,141
COIL PACKAGE AND METHOD OF FORMING A PACKAGE

Geoffrey Ronald Reed, Ham, England, assignor to The British Iron and Steel Research Association, London, England

Filed Mar. 29, 1973, Ser. No. 346,040
Claims priority, application Great Britain, May 16, 1972, 22948/72
Int. Cl. B65d 85/02, 85/54
U.S. Cl. 206—407 13 Claims



8. A packaged coil of metal strip material including: steel sheet protective material wrapped around the circumference of the coil with an axially outwardly directed overhanging projection of protective material around the outer circumferential edge at each end of the coil; protective material in the eye of the coil; a steel sheet annular member adjacent each end of the coil within said overhanging projection of protective material; and annular flexible cushioning at at least the radially outermost edge of said annular member immediately adjacent said overhanging projection of protective material.

3,856,142
INHALANT PACKAGE

William V. Vessalo, Irwin, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

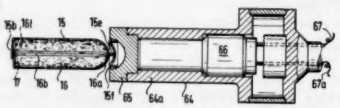
Filed Jan. 24, 1973, Ser. No. 326,166
Int. Cl. A61m 15/00; B65d 85/42
U.S. Cl. 206—437 3 Claims

1. An inhalant package comprising a frangible ampoule containing an inhalant, a wrapper having inner and outer surfaces and inner and outer ends and a central absorbent area spaced inwardly from the edges of the wrapper, the wrapper being wrapped around the ampoule in engagement therewith and projecting from the opposite ends of the ampoule, and a pressure sensitive adhesive on the inner surface of the wrapper at the opposite ends thereof and along its opposite sides, the adhesive surrounding said absorbent area, the adhesive at the inner end of the wrapper sticking to the ampoule and the adhesive at the outer end of the wrapper sticking that end to the outer surface of the wrapper, the projecting portion of the wrapper at each end of the ampoule being flattened on itself to form flat layers of the wrapper stuck together by the adhesive, and the portion of the wrapper surrounding the ampoule being porous.

3,856,143
SHAPE-RETAINING CLOSURE OF A TUBULAR PACKAGE FOR TAMPONS

Stefan Simon, Moedling, Niederosterreich; Justus Wolff, Wuppertal-Elberfeld, and Wolfgang Johst, Gevelsberg, all of Germany, assignors to Dr. Carl Hahn KG, Dusseldorf, Kaiserswerther, Germany

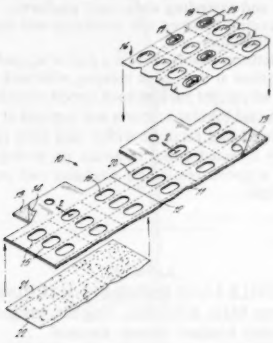
Division of Ser. No. 86,778, Dec. 22, 1970. This application June 30, 1972, Ser. No. 267,822
Int. Cl. A61f 13/20; B65d 33/16, 85/54
U.S. Cl. 206—438 3 Claims



1. A wrapped tampon comprising a tampon with a substantially rounded head end and a string containing rear end and a sleeve of substantially tear resistant material therearound wherein the end of said sleeve corresponding to the rear end of said tampon is folded over the rear end of said tampon and wherein the end of said sleeve corresponding to the head end of said tampon extends beyond the head of said tampon has a twist closure therein forward of the head of said tampon and terminates in a forwardly directed rosette having a periphery

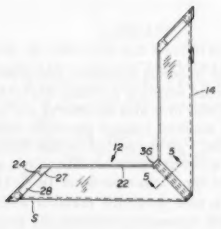
which is inwardly folded upon the forwardly directed face of said rosette, said rosette with said inwardly folded periphery reflexed toward the head of the wrapped tampon and substantially conforming to the shape of the head of said tampon.

3,856,144
BLISTER PACKAGING ASSEMBLY
Franklin Kelly, 17 Stafford Cir., Dennisport, Mass. 02639
Filed Jan. 15, 1973, Ser. No. 323,346
Int. Cl. B65d *83/04, 85/56*
U.S. Cl. 206—462 **4 Claims**



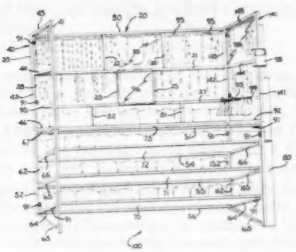
1. A blister packaging assembly comprising a semi-rigid sheet foldable along a center line, a layer of pressure sensitive adhesive on the inner face of the semi-rigid sheet, a release sheet overlying the adhesive, a plurality of windows symmetrically disposed in spaced relationship on each side of the center line in the combined semi-rigid and release sheets, a blister sheet comprising a planar portion and a plurality of blisters extending outwardly of said planar portion said blisters being receivable within the windows on one side of the center line and a fluid impervious foil carried by the outer face of the semi-rigid sheet on the portion of the semi-rigid sheet opposite the blister sheet receiving portion.

3,856,145
RECORD STORAGE RACK
Allan E. Bartholomew, North Canton, Ohio, assignor to Myers Industries, Inc., Akron, Ohio
Filed Jan. 22, 1974, Ser. No. 435,479
Int. Cl. A47g *29/00*
U.S. Cl. 211—40 **5 Claims**



1. A record storage rack comprising a pair of elongate members having upstanding side walls, the side walls of each member having corresponding ends beveled off at about a 45° angle, and complementary shaped rib and recess securing means formed on the beveled ends of said side walls for interlocking slidable engagement therebetween whereby the members can be engaged by said securing means to form an L-shaped unit for receiving and storing records.

3,856,146
HANGING MERCHANDISE DISPLAY AND CONTAINING APPARATUS
Irving Levine, 23555 Park Belmonte, Calabasas Park, Calif. 91302
Filed June 25, 1973, Ser. No. 373,398
Int. Cl. A47f *5/00*
U.S. Cl. 211—134 **1 Claim**



1. A merchandise display apparatus for displaying and storing hanging bead strands, elongated hardware members, bagged merchandise and accessories comprising:

a. a back frame, including an upper and lower portion wherein said upper portion has horizontal and vertical members which divide said upper portion into areas which may receive portions of completed hanging merchandise assemblies, means for coupling portions of said elongated hardware members to said upper portion, and means for suspending a multiple quantity of hanging bead strands from said upper portion, and wherein said lower portion has horizontal members which may receive and support shelving;

b. a pair of end frames, each comprised of an upper and lower pair, coupled to opposite ends of said back frame thereby forming a substantially U-shaped structure, wherein said upper portion has horizontal members which divide said end frame into an area which may receive portions of completed hanging merchandise assemblies, means for coupling portions of said elongated hardware members to said end frame and means for suspending accessories from said end frame within the opening of the U-shaped structure and wherein said lower portion has inclined members for supporting shelving;

c. a plurality of shelves disposed in said lower portion and supported by said inclined members in said end frames and said horizontal members in said back frame, wherein at least one of said shelves is sloped downward towards said back frame whereby bagged hanging merchandise will remain secured on said sloped shelf; and

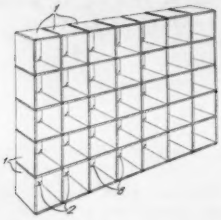
d. a side rack having five enclosed sides and one open side being coupled to said lower portion of said end frame, said side rack adapted to receive and contain said elongated hardware members.

3,856,147

STRUCTURAL COMPONENTS FOR THE COMPOSITION OF DISASSEMBLABLE PIECES OF FURNITURE

Giancarlo Piretti, Bologna, Italy, assignor to Anonima Castelli s.a.s., Bologna, Italy

Division of Ser. No. 164,592, July 21, 1971, Pat. No. 3,722,704. This application Feb. 2, 1973, Ser. No. 329,131
Int. Cl. A47f *5/00*
U.S. Cl. 211—148 **10 Claims**



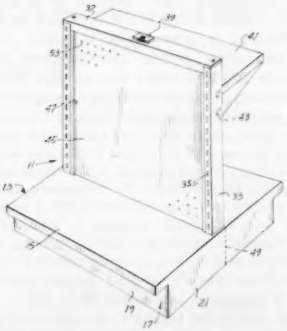
1. A structural unit comprising at least three substantially identical panels having parallel edges, a connecting member secured along each of said parallel edges, each connecting member having a pair of outwardly converging faces at substantially a right angle to one another and at angles of 45° to a median plane through the panel, one face of each of said members being formed with a longitudinally extending groove and the other face of each member being formed with a longitudinally extending rib substantially perpendicular to the respective other face and complementarily receivable in a said groove of another connecting member, said panels forming at least two right angles between them and being interconnected at angular junctions by said ribs and grooves, at least one angle reinforcement secured to the adjacent inner surfaces of said panels at each of said junctions having holes opening in a direction parallel to the ribs and grooves at the respective junction at least along one side of said panels, and a plate spanning said side and having pins extending in said direction and receivable in said holes whereby said plate is perpendicular to said panels.

3,856,148

CONVERTIBLE GONDOLA DISPLAY FOR STORES

Robert F. Olinick, Warren, Mich., assignor to The Jentzen-Miller Company, Madison Heights, Mich.

Filed Apr. 30, 1973, Ser. No. 355,810
Int. Cl. A47f *5/00*
U.S. Cl. 211—148 **2 Claims**



1. A convertible gondola island display for stores comprising a unit molded base of structural foam plastic material and of rectangular shape in plan having a monoplanar flat top platform, and a honeycomb downwardly opening skeleton body depending therefrom, including parallel spaced monoplanar side and end support walls and a series of interconnected right angularly related partitions therebetween, said walls and partitions being of uniform height with their lower edges in a single plane;

said partitions and end walls defining therebetween a pair of open-ended spaced upright tubular passages of rectangular cross section at opposite ends and throughout the height of said platform and body;

upright tubular supports of similar cross section nested and disposed within said passages and frictionally retained therein, and extending above said platform;

a cap extending between and overlying said supports and secured thereto;

said top platform having therein a pair of spaced outwardly opening slots at their ends merging with said passages;

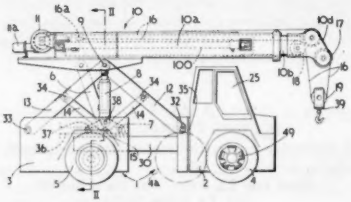
and a pair of upright parallel back panels nested within and between said tubular supports and cap and at their lower ends nested and retained within said slots respectively, inwardly directed panel retainers projecting from said tubular supports retainingly engaging said panels along their height.

3,856,149

MOBILE LOAD HANDLING MACHINES

Donald George Shaw, Albrighton, England, assignor to Shaw, Trew & Smith Limited, Shifnal England

Filed June 6, 1973, Ser. No. 367,373
Int. Cl. B62d *5/06*
U.S. Cl. 212—38 **7 Claims**



1. A mobile load handling machine, comprising: a chassis having front and rear wheeled portions movable relative to one another along the fore and aft axis of the machine; upstanding mutually inclined linkage pivotally interconnecting said chassis portions; a jib supported by said linkage from the chassis portions; a mounting member movable in a fore and aft direction on one of the chassis portions; tie linkage pivotally connected between said mounting member and the jib; and ram means pivotally connected between the mounting member and the jib whereby, on extension and retraction of the ram means, said ram means operates in conjunction with the tie linkage to effect raising and lowering luffing movement of the jib and also operates in conjunction with the mutually inclined linkage to effect relative retraction of the chassis portions to reduce the wheel base of the machine on raising of the jib and vice versa.

3,856,150

MOBILE LOAD HANDLING MEANS, PARTICULARLY TOWER CRANES

Donald Edward Wellman, Komoka, Ontario, Canada, assignor to General Crane Industries Limited, Ontario, Canada

Filed Nov. 2, 1972, Ser. No. 303,042

Claims priority, application Great Britain, Nov. 4, 1971, 51290/71

Int. Cl. B66c *23/68*

U.S. Cl. 212—46 A 9 Claims

1. Mobile load handling or lifting means comprising mobile platform means including a vehicle such as a truck, trailer or semi-trailer, a tower, pivot means mounting the base of the tower on the platform means to allow tilting movement of the tower between a vertical operating position and a substantially horizontal travelling position, and means interconnecting the platform means and the tower for moving the tower between these positions, said vehicle having a substantially flat chassis bed portion and side members connected to and extending upwardly from the sides of the vehicle flat bed portion along a major part of the length of the flat bed portion, said side members being spaced apart to accommodate the tower therebetween when the latter is in its folded travelling position and wherein the tower is supported by said flat bed portion, the side members including bracing means for reinforcing the flat bed portion against bending along its length in the vertical plane due to the weight of the tower thereon in the folded travelling position, the pivot means for the tower being carried by the side members at an elevation above the flat bed portion at least equivalent to a major part of the width of the base of the tower, the tower pivot means being disposed above the longitudinal axis of the tower when the tower is in its travelling position.

3,856,151

TELESCOPIC BOOM AND JIB ASSEMBLY WITH MEANS TO MAINTAIN A PREDETERMINED ANGULAR POSITION THEREBETWEEN

Gerald P. Lamer, Rothschild, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Nov. 29, 1973, Ser. No. 420,168

Int. Cl. B66c *23/06*

U.S. Cl. 212—55 4 Claims

1. A crane including an extensible boom having a plurality of longitudinal hollow boom sections telescoped for extension and retraction with said boom including at least a base section and a tip section having a free end, power means for extending and retracting said boom section relative to each other, a jib assembly having one end pivotally connected adjacent said free end of said tip section, a cable assembly supporting said jib assembly in a predetermined angular position with respect to said boom, said cable assembly having one end connected to said jib assembly at a location spaced a substantial distance from the pivotal connection, said cable assembly having an opposite end connected inside said tip section adjacent the telescoping end, and a plurality of freely rotatable pulleys on said boom sections with said cable assembly entrained over said pulleys, said pulleys being arranged to maintain said predetermined angle between said boom and said jib assembly while said boom sections are being extended and retracted by said power means.

3,856,152

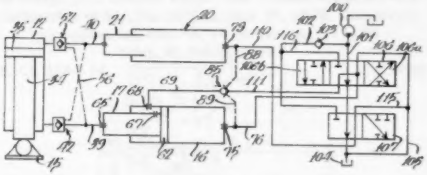
OUTRIGGER HYDRAULIC SYSTEM

John T. Parrett, St. Joseph, and David S. Frazer, Benton Harbor, both of Mich., assignors to Koehring Company, Benton Harbor, Mich.

Filed Dec. 3, 1973, Ser. No. 421,337

Int. Cl. B66c *23/62*

U.S. Cl. 212—145 24 Claims



1. A hydraulic system for an outrigger support having an extensible beam and a vertical jack cylinder at an end of the beam comprising: a hydraulic extension cylinder connectable to parts of the beam whereby extension of the rod of the extension cylinder extends said beam; a fluid circuit including a beam extension line connected to one end of the extension cylinder and a beam return line connected to the other end of the extension cylinder and a first control valve for selectively connecting said lines to either pressure fluid or to tank; said jack cylinder having a pair of fluid lines for supplying pressure fluid to said jack cylinder for either raising or lowering the jack carried by said cylinder; fluid feed means connected to one of said jack cylinder fluid lines; a second control valve in the fluid circuit for directing pressure fluid to said fluid feed means to cause lowering of the jack; a fluid line connecting the other of the jack cylinder fluid lines to the beam return line; and hydraulic means including a pilot-operated check valve for holding said beam retracted or in an intermediate extended position with said check valve being piloted open by a pilot connection to said beam extension line.

3,856,153

COUPLER YOKE WITH DRAFT GEAR REMOVAL MEANS

Geoffrey Wilton Cope, Williamsville, N.Y., assignor to Dresser Industries, Inc., Dallas, Tex.

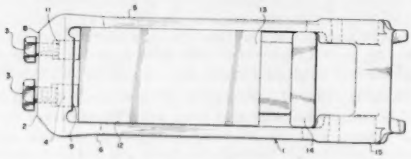
Filed Mar. 22, 1974, Ser. No. 453,624

Int. Cl. B61g *9/20*

U.S. Cl. 213—67 A 5 Claims

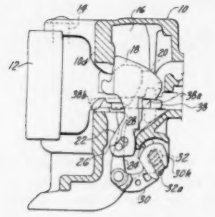
1. A yoke, for use in draft rigging of railway cars, comprising a pair of vertically spaced longitudinally extending straps connectable forwardly by tie bars or a yoke head and connectable to a coupler, and connected rearwardly by a vertically directed rear wall having inner and outer surfaces, there being at least one longitudinal aperture in the wall extending from the inner surface to the outer surface, the aperture having a larger cross-section at the inner surface than at the outer surface, a plug member slidably disposed in the larger cross-

section of the aperture and means disposed in the smaller cross-section for sliding the plug member outwardly, said



means and plug member being capable of compressing a draft gear disposed between the longitudinal straps.

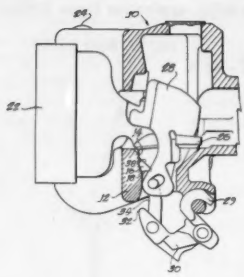
3,856,154
RAILWAY CAR COUPLER
Kenneth L. DePenti, Mayfield Heights, Ohio, assignor to Midland Ross Corporation, Cleveland, Ohio
Filed Apr. 26, 1974, Ser. No. 464,355
Int. Cl. B61g *3/08*
U.S. Cl. 213—110 **10 Claims**



1. In a car coupler of the pivoted knuckle type, mechanism therein operable for unlocking and opening the knuckle thereof, said mechanism including a rotor shaft member pivoted to the coupler and adapted upon rotation thereof to actuate said mechanism, and automatic means for effecting rotation of said shaft member, said means comprising a cam element keyed to said shaft member for rotation therewith, a lever member pivoted to said coupler, said lever member having means engageable with said element for effecting rotation thereof, said last-named means comprising a roller for rolling engagement with said element, and force exerting means acting against said lever to effect pivotal movement thereof.

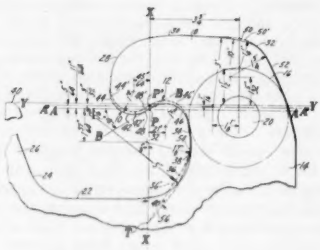
3,856,155
RAILWAY COUPLING
Russell George Altherr, Munster, Ind., assignor to Amsted Industries Incorporated, Chicago, Ill.
Filed Nov. 29, 1973, Ser. No. 420,005
Int. Cl. B61g *3/06*
U.S. Cl. 213—142 **1 Claim**

1. In a railway coupler comprising a head, a knuckle and knuckle thrower supported by said head for movement between thrown and locked positions, said knuckle thrower being movable with said knuckle toward their locked positions, a lock movable within said head between thrown, lockset and locked position, said lock being movable toward its locked position due to gravity, and a locklift assembly including a toggle for moving said lock toward its lockset position and movable with said lock toward its locked position; the improvement wherein said head includes an anti-creep ledge having an inclined upper surface sloped at an angle of about 45° to reduce the frictional force tending to hold said toggle in engagement therewith when said toggle comes into contact



with said upper surface during dropping of said lock toward its locked position.

3,856,156
RAILWAY CAR COUPLER
William J. Metzger, East Cleveland, Ohio, assignor to Midland Ross Corporation, Cleveland, Ohio
Filed Aug. 6, 1973, Ser. No. 385,747
Int. Cl. B61g *1/06*
U.S. Cl. 213—151 **10 Claims**

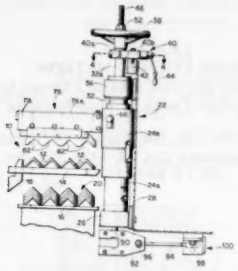


1. A car coupler having a tightened contour compared to a standard **10A** coupler contour, said coupler comprising a coupler head having a standard **10A** contour and a knuckle pivoted to said head, said knuckle comprising a nose portion having a front face and a pulling face, a heel portion, and a tail portion, said knuckle having a standard **10A** contour so modified that the pulling face of said nose portion is located approximately five sixty-fourths inch closer to the buffing face of said head as measured along the longitudinal center line of the coupler and said heel portion and adjacent front face are relieved and contoured along a smooth compound convex curve formed by several radii, said modified contour providing a contour slack of approximately five-eighths inch between two coupled couplers having heads with the standard **10A** coupler contour and knuckles of said modified contour, as measured in a direction longitudinally of said couplers, while affording substantially the same amount of horizontal and vertical angling between the said coupled couplers as is present between two coupled couplers in which the heads and knuckles are of standard **10A** contour.

3,856,157
MAGNET HOLDER FOR MATERIAL HANDLING APPARATUS

William J. Hill, Holden, Mass., assignor to Mergan Construction Company, Worcester, Mass.

Filed Feb. 5, 1973, Ser. No. 329,633
Int. Cl. B66c 1/06
U.S. Cl. 214—1 BT 9 Claims



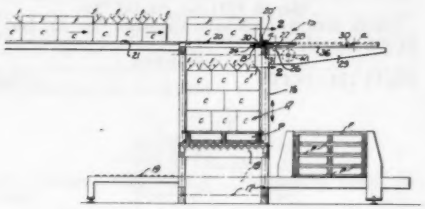
1. For use with an apparatus for handling elongated magnetic elements wherein the elements are initially arranged in a horizontal tier on spaced support members which are then extended horizontally to carry the tier of elements to a delivery position overlying a receiving means, and wherein the support members are thereafter retracted from beneath the elements to thereby deposit the elements on the receiving means, the improvement comprising: magnet holding means adjacent to the delivery position, first operating means for vertically moving said magnet holding means between a raised inoperative position spaced vertically above a tier of elements on the spaced support members at the delivery position, and a lowered operative position at which energization of said magnet holding means will produce a magnetic force causing the elongated elements to be held upwardly against said magnet holding means, whereupon following retraction of the support members from beneath the elements held upwardly against said magnet holding means, the magnetic holding means may then be de-energized to release the elements for deposit onto the underlying receiving means, and second operating means for rotating said magnet holding means in a horizontal plane between said raised inoperative position and a third position at which said magnet holding means is located to one side of said delivery position.

3,856,158
MEANS FOR PALLETIZING OPEN FLAPPED CARTONS AND THE LIKE IN A PALLET LOADING MACHINE

Richard W. Currie, Saratoga, Calif. Assignor: Currie Machinery Company, Santa Clara, Calif.

Filed Nov. 26, 1973, Ser. No. 418,945
Int. Cl. B65g 57/24
U.S. Cl. 214—6 DK 5 Claims

1. In a palletizer of the type having an elevator for raising and lowering a pallet between the lower and upper end of an elevator shaft in accordance with a coded cycle control in which a light beam emanating at one side of the elevator shaft traverses the latter adjacent its upper end and impinges upon a photo cell electrically connected to the circuit of the coded cycle control to effect stoppage of the elevator upon obstruction of such light beam by a layer of cartons and the like as the elevator arrives in proximity to a horizontally reciprocative plate at the upper end of the elevator shaft and upon withdrawal of such plate from beneath a layer of cartons thereon are deposited onto the layer of cartons on the elevator; the combination therewith of means for facilitating palletizing of open flapped cartons on such palletizer comprising a member extending across the elevator shaft adjacent and parallel to the light beam therein and having one edge parallel to the light beam hingedly connected to the underside of the stripper plate and its opposite end normally disposed at an acute angle

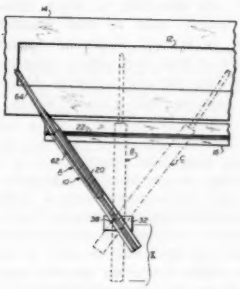


relative thereto pendently into the elevator shaft for engaging and depressing the open flap of a carton approaching the light beam.

3,856,159
SHIPSIDE CARGO CONVEYANCE DEVICE

Paul Soros, 1102 Oenoke Ridge, New Canaan, Conn.

Continuation of Ser. No. 84,662, Oct. 28, 1970, abandoned.
This application Oct. 16, 1972, Ser. No. 297,650
Int. Cl. B65g 63/04
U.S. Cl. 214—14 4 Claims

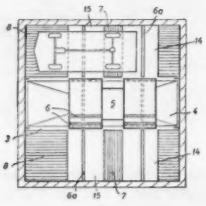


1. A device for loading a ship moored in a predetermined longitudinal orientation, said ship having longitudinally aligned cargo receiving means, an elongated structure for supporting conveyor means, said structure having a first shipside end and a second end remote from said shipside, means mounted proximate said first end enabling cargo transference between said device and said ship cargo receiving means, means including guide means supporting said elongated structure proximate said first end for movement thereof along a generally straight line path alongside and substantially parallel to the longitudinal axis of a ship moored in said predetermined orientation, said support means further including a pivot whereby said first end is movable pivotally and lineraly in the direction of the axis of said ship, a support for said second end, said support for said second end including means for permitting the pivotal movement of said elongated structure about said support for said second end between two extreme positions, said pivot for said second end being spaced from said guide means by a distance less than the length of said elongated member when said elongated member is in one of said extreme positions, and means enabling longitudinal movement of said elongated structure relative to said support for said second end, whereby as said first end is moved along said straight line path, said second end of said elongated structure moves both pivotally and longitudinally toward and away from said straight line path.

3,856,160
ELEVATOR GARAGE

Anton Roth, Mühlstrasse 19, Hanau/Main, Germany

Division of Ser. No. 766,389, Oct. 10, 1968. This application May 10, 1971, Ser. No. 141,759
Claims priority, application Germany, Oct. 13, 1967, 16 84 904; Oct. 22, 1968, 17 59 941
Int. Cl. E04h 6/06
U.S. Cl. 214—16.1 DC 5 Claims



1. A structure for parking a vehicle on superposed floors has an elevator, vehicle storage means on each floor and a shaft space receiving said elevator and extending through said floors, said vehicle including a first rotatable ground engaging means near one longitudinal end and a second rotatable ground engaging means near the other end,

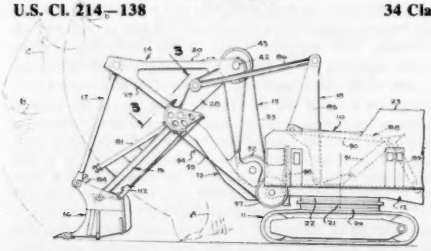
comprising in combination:

a pair of transfer means removably disposed on said elevator and operable to move transversely of the vehicle length, each of said transfer means being operable to receive a ground engaging means, respectively, at least two vehicle storage means disposed adjacent said elevator on each floor including a receiving portion, said transfer means being movable with a vehicle thereon to a place near said storage means, displacing means mounted on said transfer means for lengthwise displacement of the vehicle into said storage means from said transfer means in said place, said displacement means being operative to engage a ground engaging means of said vehicle whereby there occurs a shifting of said ground engaging means lengthwise of said vehicle onto a receiving portion therefor while the other ground engaging means is moved to an area disposed forwardly of said transfer means, said receiving portion being disposed between said pair of transfer means.

3,856,161
POWER SHOVEL

George B. Baron, Marion, Ohio, assignor to Marion Power Shovel Company, Inc., Marion, Ohio

Filed Nov. 2, 1973, Ser. No. 412,257
Int. Cl. E02f 3/00
U.S. Cl. 214—138 34 Claims

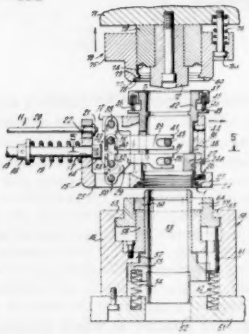


1. A power shovel comprising a body, a stiffleg pivotally connected at the lower end thereof to said body, a hoist frame pivotally mounted on said stiffleg, a dipper handle pivotally mounted on said hoist frame, a dipper pivotally connected to said dipper handle, a hoist link pivotally interconnected to said hoist frame and said dipper, said stiffleg and the components supported thereon having sufficient weight to provide a self-crowding action of said dipper when said stiffleg is permitted to pivot downwardly, means for pivoting said stiffleg upwardly to retract said dipper and means for hoisting said dipper.

3,856,162
CLOSURE FEEDING METHOD

John Jesevich, Cicero, and Vyto Simkus, Chicago, both of Ill., assignors to American Flange & Manufacturing Co. Inc., New York, N.Y.

Division of Ser. No. 131,258, April 5, 1971, Pat. No. 3,800,401. This application Oct. 25, 1973, Ser. No. 409,392
Int. Cl. B65g 1/06
U.S. Cl. 214—152 4 Claims

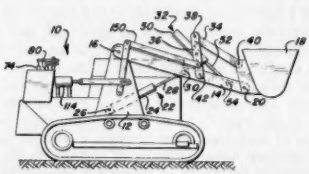


1. The method of simultaneously feeding a closure flange and a tag ring element into an insertion die for securing the same to a container wall, comprising the steps of supporting a closure flange and a tag ring element in vertically spaced juxtaposition, advancing said closure flange and said tag ring element horizontally into said insertion die, displacing said closure flange and tag ring element vertically away from each other, releasing said closure flange and said tag ring element in said insertion die and supporting said closure flange and said tag ring element in said insertion die for permanent securing about a container wall opening.

3,856,163
METHOD OF USING A HYDRAULIC LEVELING CIRCUIT ON AN IMPLEMENT

David H. Seaberg, Davenport, Iowa, assignor to J. I. Case Company, Racine, Wis.

Division of Ser. No. 272,365, July 17, 1972, Pat. No. 3,811,587. This application Dec. 14, 1973, Ser. No. 424,920
Int. Cl. B65g 7/00
U.S. Cl. 214—152 3 Claims



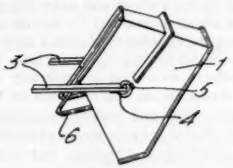
1. A method for controlling a boom pivoted on a vehicle by a boom ram and a material handling unit pivoted on the boom

by a unit ram comprising the steps of supplying fluid under pressure through a pump from a reservoir to first and second valves; selectively actuating said valves to supply fluid under pressure to said rams for pivoting the boom on the vehicle and pivoting the unit on the boom; and supplying fluid under pressure from said reservoir through an auxiliary circuit bypassing said pump to the unit ram to provide fluid for maintaining a predetermined attitude of said unit relative to a reference plane while the boom is being raised and lowered.

3,856,164
TIPPABLE CONTAINERS

Bjarne Torvund, 5870 O., Ardal, Norway

Filed Apr. 24, 1973, Ser. No. 354,049
Claims priority, application Norway, Apr. 28, 1972, 1518/72
Int. Cl. B65g *65/04*
U.S. Cl. 214—315 **1 Claim**

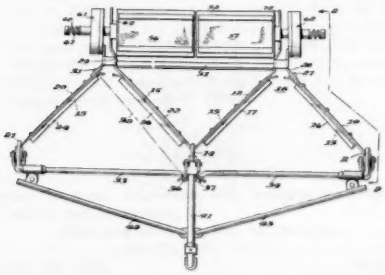


1. The improvement in pivotal containers which are adapted to be lifted by the forks of a fork lift truck comprising mountings mounted for rotational movement relative to the container on both sides of said container in the form of a curved spiral shaped member, said member at its smallest radius portion being adapted to engage and lock onto the tips of said forks such that as its larger radius portion comes into engagement against the underside of the fork, the fork is locked to said member by the resilient clamping action between the smallest and the larger radius portions, whereby the container can be pivoted relative to said forks and thereby dumped.

3,856,165
BALL RETRIEVER

August W. Gustafson, and Edna L. Gustafson, both of 350 Pasadena Pl., Corpus Christi, Tex. 78411

Division of Ser. No. 288,263, Sept. 12, 1972,. This application Feb. 7, 1974, Ser. No. 440,555
Int. Cl. B60p *1/00*
U.S. Cl. 214—356 **3 Claims**

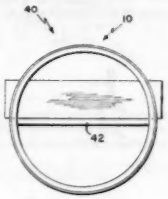


1. In apparatus for retrieving balls from the ground, a frame including plates which diverge from each other in proceeding forwardly, wheels supporting the forward ends of the plates, a rear wheel supporting the rear end of said frame, a disc member carried by said frame adjacent said rear wheel, said plates being positioned for guiding balls into a space between the disc and said rear wheel, resilient projections carried by a side face of the rear wheel confronting said disc, said disc having resilient projections confronting the resilient projections on the rear wheel, said projections flaring outwardly adjacent their base, said disc having an opening in the upper peripheral portion, a receptacle carried by the frame adjacent said disc, and a cam between the disc and the wheel for deflecting balls into the receptacle.

3,856,166
HAND TRUCK

Louis J. Gibson, 1014 Anna Rd., Huntingdon Valley, Pa. 19006

Filed Jan. 26, 1973, Ser. No. 326,972
Int. Cl. B62b *1/09*
U.S. Cl. 214—370 **10 Claims**



1. A hand truck comprising an outer wheel means having a hoop-like configuration of substantial diameter and including a pair of spaced apart hoop members, an inner rim means of a hoop-like configuration mounted concentrically within said wheel means including a hoop-like rim mounted on each of said hoop members and having a circular rim portion within the interior of said wheel means, bearing means between said wheel means and said inner rim means providing for relative rotating movement therebetween whereby the truck may be moved by hand as a hoop along a surface with the wheel means rotating about the rim means, means between said spaced apart hoop members for supporting articles to be transported by said hand truck, and frame means extending between said rim members for holding the same together in spaced apart relation and to provide substantial clearance around said circumference thereof for receiving an article to be transported by relative radial-like movement through the cleared spaced-apart circumferential portions of said rim members, said frame means being located to provide a circumferential clearance of at least 180° for receiving articles between said spaced apart rim members.

3,856,167
SPARE WHEEL HOLDING DEVICE

Setsuo Yasue, Gifu-ken, and Tomio Yamamoto, Aichi-ken, both of Japan, assignors to Sank Kiki Kabushiki Kaisha, Nageipa, Japan

Filed Jan. 2, 1973, Ser. No. 320,534
Claims priority, application Japan, Dec. 30, 1971, 47-2262
Int. Cl. B62d *43/04*
U.S. Cl. 214—451 **8 Claims**

1. Apparatus for holding a spare wheel on a motor vehicle, comprising:

a casing adapted to be secured to the underside of the chassis of a motor vehicle;

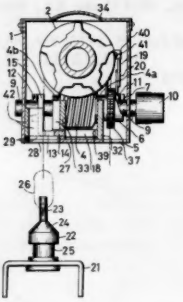
a winch mechanism supported by said casing and including a bidirectionally rotating means;

an elongate flexible member passed at least partly around said rotating means and having one end adapted to be raised upon rotation of said rotating means in one direction, while being lowered upon rotation of said rotating means in the opposite direction;

a wheel support member connected to said one end of said flexible member and adapted to support a spare wheel;

a lock means supported by said casing;

a shoulder means formed on said wheel support member; and,



an actuating means operationally associated with said rotating means for actuating said lock means to cause said lock means to engage said shoulder means to hold said wheel support member in a raised position upon rotation of said rotating means in one direction, while said lock means is caused by said actuating means to disengage from said shoulder means to permit lowering of said wheel support member upon rotation of said rotating means in an opposite direction.

3,856,168

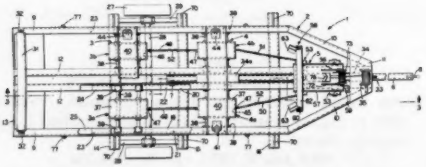
BOAT TRAILER CONSTRUCTION

Robert J. Mauck, Pinconning, Mich., assignor to John J. Buta, Deerand, Mich.

Filed May 3, 1973, Ser. No. 356,927

Int. Cl. B60p *3/10*

U.S. Cl. 214—505 **9 Claims**



1. A boat trailer construction including frame means; a pair of spaced wheel mounted on the frame means for movement of the trailer along the ground; a drawbar pivotally mounted on the frame means and extending longitudinally forwardly from the frame means; hitch means mounted on the drawbar for attaching the drawbar to a towing vehicle; the frame means including a pair of spaced, parallel, longitudinally extending outer channel members, and a pair of spaced, parallel, longitudinally extending inner channel members, said inner channel members being parallel with said outer channel members; ramp means formed on the outer and inner channel members; said ramp means being formed in the rear end portions of said channel members and aligning transversely with respect to each other; first carriage means mounted on the inner pair of channel members including boat receiving cradle means, means for securing a boat onto the cradle means, and a plurality of first rollers mounted on the first carriage means for movement of said carriage means along the inner channel members; at least second carriage means movably mounted on the inner and outer pairs of channel members; said second carriage means including a pair of subcarriages, each of said subcarriage having a pair of axles extending transversely between one of the inner channel members and the adjacent outer channel member; a plurality of second rollers being rotatably journaled on the ends of said axles engageable with the inner and outer channel members for moving said second carriage means along the channel members; a support channel being mounted on and extending upwardly from the subcarriage axles; a platform extending transversely across and spaced above the frame means and mounted on the support channels; boat supporting pad means extending upwardly from the ends of the platform; chain means extending between the first and second carriage means; and winch means mounted on the frame means operatively connected to the first carriage means for longitudinally moving all of the carriage means forwardly along the frame means by successively tensioning the chain means between said carriage means whereby the carriage means successively engage a boat floating in the water and lift the boat upwardly upon movement of the carriage means upwardly along the ramp formations.

3,856,169

APPARATUS FOR COLLECTION OF SEDIMENT IN BOTTLED FLUIDS

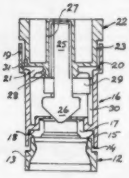
John Stuart Wilson, 180 Kingston Rd., Heatherton, Australia (3202), and Ronald George Cutts, 3 Hazel Ave., Highett, Victoria, Australia (3190)

Filed July 5, 1973, Ser. No. 376,332

Claims priority, application Australia, July 7, 1972, 9609/72

Int. Cl. B65d *1/04*

U.S. Cl. 215—6 **8 Claims**



1. A capping assembly adapted to be inverted over the top of a bottle containing fluid from which sediment can be collected, said capping assembly comprising a body member having port means for egress of the collected sediment, means for securing said body member to the neck of said bottle, a conical probe member mounted for controlled longitudinal movement within said body member and spaced therefrom to

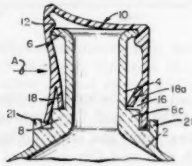
form therewith a well for collecting such sediment, cap means operatively connected to said probe member for controlling the longitudinal movement of the probe member between first and second positions, first seal means for sealing said well when said probe member is in said first controlled position and opening said well to said port means when said probe member is in said second controlled position, and second seal means disposed adjacent the inner end of said probe member for sealing said bottle when said probe member is in said second controlled position thereby permitting withdrawal of such sediment from said well through said port means.

3,856,170

SNAP-TOP BOTTLE CAP WITH SAFETY PRY-OFF

Milton Kessler, 6690 Harrington Ave., Youngstown, Ohio 44512

Filed June 14, 1973, Ser. No. 370,016
Int. Cl. B65d *55/02, 85/56;* **A61j** *1/00*
U.S. Cl. 215—224 **5 Claims**



1. Safety means for containers comprising in combination
a. a container having a cylindrical pouring spout with a thin annular outwardly-extending flange at the top of the spout,
b. and a plastic snap-cap snugly fitting the top of said spout, said cap having an internal annular flange elastically engaging the underside of said outwardly-extending flange to retain said cap on the spout,
c. said cap having a downwardly-extending semi-rigid cylindrical wall surrounding said cylindrical pouring spout and of sufficiently greater diameter than the outer diameter of said spout to provide a substantial cylindrical gap between said wall and said spout,
d. a small lug in said gap extending at the base of said cylindrical spout toward said cylindrical wall of the cap and fixed to said container,
e. a semi-rigid bar of the same plastic material as the cap and unitary therewith extending diagonally downward from a point above said lug toward said lug but not as far as the lug, even when the cap is rotated so that the lug and bar have the same orientation, said bar being sufficiently stiff so that when the cap is rotated to have the same orientation as the lug and the side of the cap containing the bar is pressed toward the spout, the end of the bar will engage the lug and pry at least a portion of the snap cap off the annular flange so that the cap can then be readily removed from the spout.

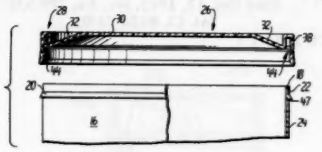
3,856,171

CAP FOR CONTAINER

Anthony T. Rossi, Bradenton, Fla., assignor to Tropicana Products, Inc., Bradenton, Fla.

Filed May 18, 1973, Ser. No. 361,632
Int. Cl. B65d *41/32*
U.S. Cl. 215—256 **6 Claims**

1. Apparatus comprising:
a container including:
a bottom wall portion,
a circumferentially extending sidewall portion terminating at an open upper end defining an upper container edge, and
a circumferentially extending, interlock projection on said sidewall portion adjacent said open upper end of said container, said interlock projection facing outwardly of said sidewall portion and dividing said sidewall portion into:
an upper, lip section terminating in said upper container edge, and
a lower section extending to said bottom wall portion of said container;
a cap for closing said container, said cap including:
a cover section comprising:
a central flat portion, and
a sloping edge portion sloping downwardly and radially outwardly from said central flat portion, and
a generally inverted U-shaped seating section for receiving said upper lip section of said sidewall portion of said container, said seating section comprising:
a generally upright wall portion integral at its lower end with said sloping edge portion of said cover section and rigidified thereby at its juncture with said sloping edge portion, said generally upright wall portion being of a length sufficient to project into said container on the inner side of said sidewall portion by substantially the depth of said lip section, and



an outer, circumferentially extending, depending skirt portion for embracing the outer side of said container sidewall portion, said skirt portion including:
a main body,
a tear strip contiguous with and depending from said main body for a substantial circumferential extent of said main body, which extent terminates at a section of said main body thicker than, integral with and forming a circumferential continuation of said tear strip, and
an inwardly facing circumferentially extending groove, defining the juncture of said main body and the tear strip depending therefrom, for interlocking with said interlock projection of said container;
said rigidified juncture of said generally upright wall portion of said seating section and said sloping edge portion of said cover section being disposed adjacent said circumferentially extending interlock groove to enhance maintenance of a positive seal at the location of said interlock projection of said container and said groove of said cap.

3,856,172

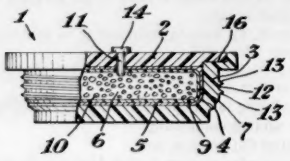
VACUUMIZED PLASTIC CAP FOR HEAT INSULATING CONTAINERS

Wilhelm E. Walles, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 20, 1973, Ser. No. 389,748
Int. Cl. B65d *39/08;* **A47j** *41/02*
U.S. Cl. 215—364 **7 Claims**

1. A vacuum plastic cap comprising encapsulating boundary wall of a normally solid plastic material completely enclosing

an evacuated space, a layer of metal on at least one entire surface of said boundary wall, an overcoating of a barrier



plastic adherent to the entire metal layer and a gas absorbing material residing in the evacuated space enclosed by the boundary wall to absorb gases present in said evacuated space.

3,856,173

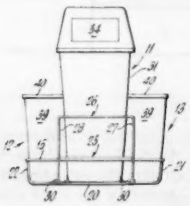
TRASH RECEPTACLE

Loryn B. Deane, and Edward V. Deane, both of 18 Overlook Rd., Ardsley, N.Y. 10502

Filed Oct. 17, 1972, Ser. No. 298,338

Int. Cl. B65d *21/02*

U.S. Cl. 220—1 T **1 Claim**



1. A trash receptacle comprising a rack having a substantially rectangular, horizontally disposed frame including two long sides and two short side portions, one of said long sides having a portion disposed centrally thereof spaced outwardly therefrom and in the plane of said frame, legs carried by said frame to support the frame in spaced relationship to a supporting surface, a first trash receptacle of rectangular configuration positioned centrally in said rack and engaging the other long side and said central portion of said one side to retain said container centrally of said rack and a pair of outer containers engaging the end portions of said rack and positioned in adjoining relationship to the walls of said central container, said first trash receptacle being tapered downwardly and inwardly and said outer receptacles having walls adjoining the first said receptacle which are parallel to the walls of said first receptacle and said rack includes a structure secured to and extending upwardly therefrom and in spaced relationship to said first container.

3,856,174

LARGE-VOLUME CONTAINER

Otto Ernst Hartmann, Wackersberg/Bad Tolz, Germany, assignor to Cota-Spedition International Container-Transporte GmbH & Co., Berlin, Germany

Filed Mar. 5, 1973, Ser. No. 337,860

Claims priority, application Germany, Nov. 10, 1972, 2255147

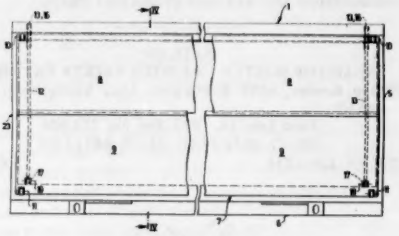
Int. Cl. B65d *7/12*

U.S. Cl. 220—1.5 **20 Claims**

1. A rectangular-shaped large-volume container comprising:

a horizontally disposed floor, a front wall, a rear wall, and first and second side walls,

said rear wall being constructed as a lockable and openable rear door and an upper rear wall frame member extending between said first and second side walls, said upper rear wall frame member being removable from position for accommodating loading of said container from the rear when said rear door is open,



said first side wall being formed by respective upper and lower flap members, said flap members being pivotal about respective upper and lower horizontally extending flap axes such that said flap members together form a substantially solid first side wall when said flap members are in respective first positions and such that said first side wall is substantially open for accommodating loading of said container from the side of said first side wall when said flap members are in respective second positions.

3,856,175

MOLDED RUBBER PRODUCTS AND RELATED COMPOSITIONS

William R. Dunlop, Buffalo Grove, Ill., assignor to The Richardson Company, Des Plains, Ill.

Continuation-in-part of Ser. No. 5,891, Jan. 26, 1970, abandoned. This application June 27, 1972, Ser. No. 266,806

Int. Cl. B65d *1/26, 85/00;* **C08d** *9/08*

U.S. Cl. 220—22 **10 Claims**

1. A vulcanizable composition comprising about 6–20 weight percent of a styrene-butadiene copolymer rubber containing 5–30 weight percent styrene, about 50–80 weight percent of a finely divided inert filler having a particle size below about 80 microns selected from the group consisting of coal, talc and hard rubber dust and from about 2 to about 8 weight percent of a resin of a styrene butadiene copolymer containing about 70–90 weight percent styrene and having a softening temperature of about 150°–250°F to provide in the composition when cured a tensile strength of at least about 670 psi at room temperature and an impact resistance of at least about 3 inches (with a 2 lb. ball) at 0°F. and based on the rubber about 30–70 weight percent of a processing oil having viscosity of about 40–180 SUS at 210°F, about 40–100 weight percent of an activator selected from alkaline earth hydroxides or carbonates and about 4–12 weight percent sulfur.

3,856,176

COVER WITH REPLACEABLE COVERING MATERIAL

Fay G. Carter, San Jose, Calif.

Continuation of Ser. No. 207,483, Dec. 13, 1971, abandoned. This application Oct. 10, 1973, Ser. No. 405,154

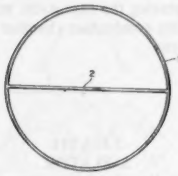
Int. Cl. B65d *51/02;* **A47j** *36/06*

U.S. Cl. 220—24 R **2 Claims**

1. A cover for pots and pans consisting of:

a frame consisting of an outer circular frame having a circu-

lar cross-section and a cross member extending along the diameter of said outer circular frame and attached at both ends to said outer circular frame, said cross member being formed into a handle at one location along the length of said cross member, said handle being perpendicular to said outer circular frame; and



a replaceable, disposable deformable, non-flamable covering material replaceably wrapped about said frame to form the covering of said cover, said covering material maintaining its own shape after being wrapped about said frame so as to maintain itself onto said frame; and

said handle extending above said covering material.

3,856,177

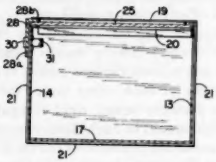
FIRE EXTINGUISHER CABINET

William L. Fudge, Minneapolis, Minn., assignor to Larsen's Manufacturing Company, Minneapolis, Minn.

Filed Sept. 6, 1973, Ser. No. 394,738

Int. Cl. B65d *25/54, 43/12*

U.S. Cl. 220—82 R **4 Claims**



1. In an improved fire extinguisher cabinet comprising:

a. an elongated open front rectangular box having spaced side walls and spaced top and bottom walls;

b. spaced guideway means, extending along an edge of each of said top and bottom walls adjacent the open front;

c. an elongated, breakable, transparent panel member for closing the open front slidably insertable into and removable from said guideways transversely of the longitudinal dimension of said panel members and box;

d. an angular edge portion rigidly attached to one of said side walls adjacent said open front so as to overlie an adjacent edge of said panel, said one side wall limiting movement of said panel member along said guideways in one direction;

e. a removable closure member extending substantially between said top and bottom walls for limiting movement of said panel along said spaced guideways in an opposite direction when in a closure forming position;

f. said closure member having an L-shaped cross section with one leg thereof disposed in justaposition to said other side wall and the other leg thereof disposed to overlie an adjacent edge of said panel member in the closure forming position;

g. the other of said side walls having an opening formed therethrough adjacent said open front and generally midway between said top and bottom walls;

h. lock means mounted on said one leg generally midway between opposite ends thereof for insertion into the opening in said other side wall and having a lockable engagement with said other side walls; and

i. said other leg portion having opposite end portions which are each received within an adjacent guideway when said closure member is in the closure forming position.

3,856,178

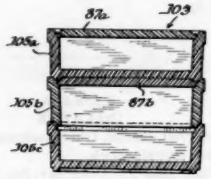
INSULATED SHIPPING CONTAINER

Arthur J. Norgaard, Deerfield, Ill., assignor to General Box Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 133,499, April 13, 1971, abandoned. This application Apr. 17, 1972, Ser. No. 244,597

Int. Cl. B65d *21/02*

U.S. Cl. 220—23.83 **3 Claims**



1. An insulated shipping container of modular construction comprising:

an outer shell for forming a protective exterior envelope;

a plurality of nestable units arranged in a stack configuration and disposed within said outer shell, said nestable units having an enclosure wall extending around side portions thereof and an open top, said nestable units having a nesting flange adjacent the open top thereof for receiving another of said nestable units and a closure flange, disposed below and inwardly of said nesting flange, for receiving a cap to form a closure on the open top of said nestable units, said nestable units including a receptacle having a floored bottom, said nestable units including a spacer unit having an open floor, said spacer unit combining with an associated nestable unit to form a double unit compartment; and

at least one cap positioned on the closure flange of a nestable unit in sealing engagement therewith.

3,856,179

CONTAINER END WITH PROTECTIVE BEAD

James D. Fox, Darlington; Earl P. Norman, Jr., and Jerry F. Sansbury, both of Hartsville, all of S.C., assignors to Sonoco Products Company, Hartsville, S.C.

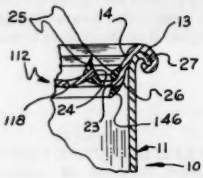
Continuation-in-part of Ser. No. 162,379, July 14, 1971, Pat. No. 3,754,678. This application May 3, 1973, Ser. No. 356,871

Int. Cl. B65d *17/20*

U.S. Cl. 220—54 **4 Claims**

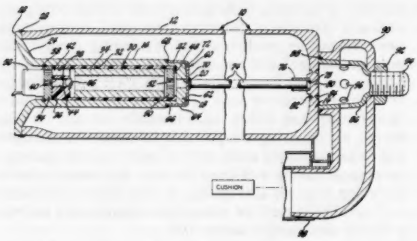
1. A container end comprising an end panel; a removable portion in said end panel; said removable portion defined by

a score line; pull means attached to said removable portion for removal thereof by tearing along said score line; and protective means over said score line on each side thereof for protecting the sharp edges of the removed portion and the remaining residual lip of said end panel, whereby a force applied



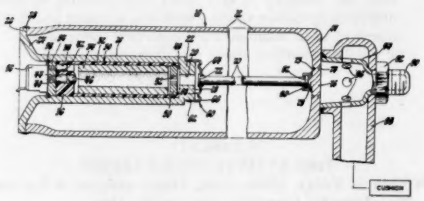
to said pull means effects a tearing action along said score line and through said protective means such that a protective shield extends over the edge of said removable portion and said residual lip.

3,856,180
INFLATOR
Richard L. Merrell, Huron, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed June 25, 1973, Ser. No. 373,283
Int. Cl. F17c *7/00*
U.S. Cl. 222—5 **1 Claim**



1. An inflator comprising, in combination, a generally cylindrical pressure vessel containing pressure fluid and having an outlet for communicating the inflator with an occupant restraint cushion, rupturable means closing the outlet, generally cylindrical combustion chamber coaxially within the pressure vessel and containing a charge of propellant for generating gas, the chamber including a generally radially extending end wall at one end thereof having an outer surface provided with a central flat portion and a surrounding tapered portion, the end wall including a normally open outlet through the flat portion communicating the combustion chamber with the pressure vessel, a diaphragm cap of thin frangible material telescoped over the end of the combustion chamber and including an axial wall surrounding and secured to the chamber and a radial wall seating on the flat portion of the outer surface of the end wall of the chamber around the outlet to close the outlet, the seating of the radial wall of the cap on the flat portion of the outer surface of the end wall supporting the radial wall against rupture by the pressure fluid within the pressure vessel, and rigid means mounted on the radial wall of the cap and projecting to adjacent the rupturable means for impacting and rupturing the rupturable means upon generation of gas within the combustion chamber and rupture of the radial wall of the cap.

3,856,181
INFLATOR
Richard L. Merrell, Huron, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed June 25, 1973, Ser. No. 373,284
Int. Cl. F17c *7/00*
U.S. Cl. 222—5 **4 Claims**



1. An inflator comprising, in combination, a pressure vessel containing pressure fluid and having an outlet for communicating the inflator with an occupant restraint cushion, first closure means closing the outlet, a combustion chamber containing a charge of propellant for generating gas and having an outlet for communicating the combustion chamber with the pressure vessel, second closure means closing the chamber outlet, the first and second closure means being rupturable in directions opposite of each other under the pressure of the fluid within the pressure vessel, rigid elongate means, means mounting the rigid means to each closure means whereby each closure means under the pressure of the fluid within the vessel exerts a force on the other closure means in a direction opposite its rupturable direction, and means for adjusting one of the mounting means to correspond the spacing of the first and second closure means to the length of the rigid elongate means.

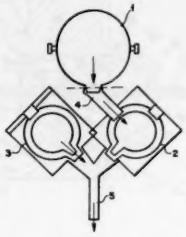
3,856,182
APPARATUS FOR REGULATING MOLTEN METAL SUPPLY
Aristide Berthet, and Jacques Blum, both of Metz, France, assignors to Institut De Recherches De La Siderurgie Francaise (IRSID), Saint Germain-en-Laye, France
Continuation-in-part of Ser. No. 230,746, March 1, 1972, Pat. No. 3,773,218. This application Nov. 7, 1973, Ser. No. 413,662
Int. Cl. B22d *37/00*
U.S. Cl. 222—56 **7 Claims**

1. An apparatus for supplying a substantially constant flow of molten metal from metal supplying means to a metallurgical equipment comprising:

at least two intermediate tipping vessels, means for alternatively filling said vessels from said metal supplying means and emptying the vessels into said metallurgical equipment to obtain a continuous flow of molten metal;

means for determining the actual flow rate of metal running out from the vessel being emptied;

means for providing a reference quantity corresponding to a desired constant supplying flow rate of molten metal;



comparison means for developing a differential signal by comparing said actual flow rate and said desired constant flow rate to give a differential signal corresponding to the difference of said flow rates; and

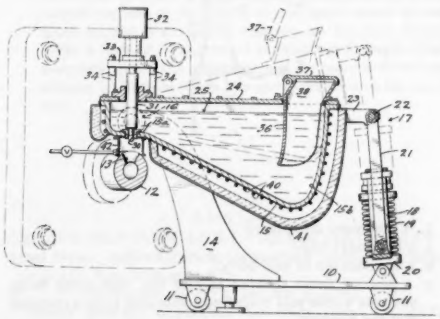
regulating control means responsive to said differential signal for controlling the speed of tipping of each of said tipping vessels so as to maintain said differential signal at a substantially zero value.

3,856,183

TILTING MOLTEN METAL DISPENSER WITH CONSTANT LIQUID HEAD CONTROL

Alfred F. Bauer, Toledo, Ohio, assignor to NL Industries, Inc., New York, N.Y.

Filed Mar. 25, 1974, Ser. No. 454,242
Int. Cl. B22d *37/00*
U.S. Cl. 222—70 **4 Claims**



1. A device for metering charges of metal from a reservoir to a point of use comprising

a metal supply pot,

pivot means adjacent one end of said pot defining a pivot point.

a discharge valve having a valve seat in the lower wall of said supply pot close to said pivot point,

said lower wall extending downwardly and away from said discharge valve,

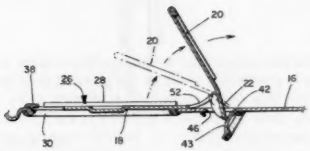
means to support said supply pot for tilting movement around said pivot point to maintain a substantially constant head of molten metal over said discharge valve seat, and means to open said discharge valve for a predetermined time period whereby substantially equal charges of metal flow through said discharge seat at each valve opening.

3,856,184

EASY-OPENING CONTAINER CLOSURE HAVING A SLIDING TAB

John J. Luviano, Rydal, Pa., assignor to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Filed Aug. 30, 1972, Ser. No. 285,000
Int. Cl. B65d *47/10*
U.S. Cl. 222—80 **15 Claims**



1. A closure of the easy opening type comprising:

a closure panel having a dispensing aperture therein and an at least partially pre-formed vent hole spaced therefrom;

an easy opening tab including a sliding portion closing said dispensing aperture, a flip-over portion having a hinged connection with said sliding portion, and a vent hole puncturing portion extending from said flip-over portion, said flip-over portion being double-backed over said sliding portion when said tab is in the closed position with said vent hole puncturing portion extending away from said closure panel, said vent hole puncturing portion contacting said partially pre-formed vent hole when said flip-over portion is pivoted about said hinged connection to a position extending outwardly away from said sliding portion, said flip-over portion forming a lever having a fulcrum at said hinged connection, the overall length of the lever arm of said flip-over portion being longer than the distance from the point of contact between said partially preformed vent hole and said hinged connection so as to provide a substantial mechanical advantage in puncturing said end panel at said partially pre-formed vent hole.

3,856,185

SINGLE DOSE, REPLACEABLE SUPPLY AIR PRESSURE OPERATED DISPENSER

Pasquale R. Riccio, Salem, N.H., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

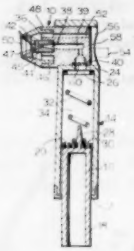
Filed Dec. 26, 1973, Ser. No. 427,854
Int. Cl. B67d *5/54*
U.S. Cl. 222—193 **10 Claims**

1. A single dose replaceable product supply dispensing device comprising:

a piston-cylinder means having a movable member and a fixed member having a compressed air flow path there-

through with an aperture at the end remote from said movable member;

a single dose replaceable product dispensing member having a product dispensing aperture and adapted to be operatively connected to said fixed member and having a compressed air flow path therethrough, said flow path being operatively positioned relative to said compressed air flow path of said piston-cylinder means when said product dispensing member is connected to said fixed member for communication therebetween, said dispensing member further having a product supply chamber, and aspirating means in said compressed air flow path communicating with said product supply chamber for dispensing said product via said product dispensing aperture; and



a diaphragm member normally blocking the compressed air flow path and adapted to open only when said movable member approaches thereto, during its compression stroke;

whereby as said movable member moves toward said fixed member in a compression stroke, air is compressed in the fixed member, said diaphragm member remaining closed until said movable member substantially reaches the end of its compression stroke whereupon said diaphragm member opens, allowing compressed air to travel along said compressed air flow path into said product dispensing member and through said aspirating means, product being dispensed thereby.

3,856,186

PRESSURE VESSEL FILL AND BLEED VALVE ASSEMBLY

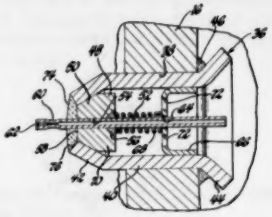
Charles N. Hay, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed June 25, 1973, Ser. No. 373,285

Int. Cl. B65d *47/10*

U.S. Cl. 222—402.16 **4 Claims**

1. In combination with a pressure vessel having an apertured wall, a fill and bleed valve assembly, comprising, an annular hollow housing adapted to extend through the aperture in the wall of the pressure vessel and to be secured thereto, said housing including an outer end portion provided with a tapered inner surface, a valve member slidably received within the housing and including an outer tapered surface complementary to the tapered inner surface of the housing, resilient means biasing the valve member outwardly of the housing to seat the tapered outer surface thereof on the tapered inner surface of the housing, said valve member including a bore therethrough opening at its inner end to the housing and opening at its outer end to a hollow extension projecting outwardly of the valve member and of the outer end of the housing, means closing the outer end portion of the extension, the valve member being displaceable against the resilient biasing means to permit pressure fluid to flow between the valve member and the housing into the pressure vessel to fill



the vessel, and means permanently sealing the valve member to the housing after the pressure vessel has been filled, removal of the closed outer end portion of the extension permitting pressure fluid to bleed out of the pressure vessel through the bore of the valve member and any unremoved portion of the extension.

3,856,187

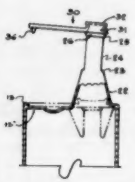
CONTAINER WITH COLLAPSIBLE POURING SPOUT AND SELF OPENING VENT HOLE

Walter K. Chlystun, 327 St. James Dr., Spartanburg, S.C. 29301

Filed Dec. 3, 1973, Ser. No. 421,431

Int. Cl. B67d *5/12*

U.S. Cl. 222—529 **9 Claims**



1. A container comprising:

a. a container body;

b. a top secured to said body;

c. a pouring spout secured to said top, said spout being nestable within said body and removable to an extended, pouring position;

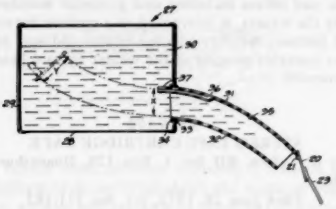
d. a pull tab secured to said spout adjacent an upper end thereof, said tab further being secured to said top; and

e. a weakened area in said top adjacent said point of securement of said pull tab, whereby pulling on said tab causes rupture of said weakened area and produces a vent opening in said top and further pulling on said tab withdraws said spout from said nested position.

3,856,188
DISPENSER FOR LIQUIDS AND SOLIDS WITH SELF-CONTAINED SPOUT

Terrell B. Newby, 1204 Golden Oak Way, San Jose, Calif. 95120

Filed Feb. 21, 1973, Ser. No. 334,240
Int. Cl. B65d 17/24
U.S. Cl. 222—535 14 Claims



1. A fluid tight dispenser for materials which has a pop-open feature with a self-contained spout comprising:

a container having a hollow body portion closed at its opposite ends respectively by a plate-like top wall and a bottom wall;

a break-away portion formed in said top wall;

pull means attached to said break-away portion on its outer surface operable when manually manipulated to force a partial separation between said break-away portion and said top wall thereby forming an aperture in said top wall when the break-away portion is removed; and

tubular hollow rigid spout means located within said hollow body portion, said spout means having a smooth outer wall and also having one end thereof attached to the inside surface of said break-away portion so said spout means can be extracted through the aperture formed as said break-away portion is separated from said top wall, said spout means sized to said aperture so its smooth outer wall continuously engages and expands the periphery of the aperture in a sealing relationship along a substantial portion of the length of said spout means as said spout means is extracted whereby an exterior service spout is formed as said spout is extracted through which materials within the dispenser can be poured therefrom without leakage between the spout means and the aperture.

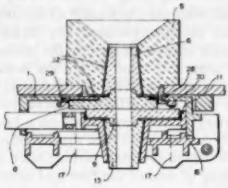
3,856,189
REMOVABLE SLIDE GUIDE FOR A SLIDE CLOSURE

Ernst Meier, Adliswil/Zurich, Switzerland, assignor to Interstop AG, Zug, Switzerland

Filed Dec. 8, 1972, Ser. No. 313,262
Claims priority, application Germany, Dec. 10, 1971, 2161368
Int. Cl. B67d 3/00
U.S. Cl. 222—537 9 Claims

1. In a side closure for the pouring spout of metal melt containing vessels, such as steel pouring ladles, such slide closure including a slide housing on said vessel adjacent said spout thereof, a refractory orifice plate fixedly positioned against said vessel, a refractory slide plate having a refractory outflow sleeve attached thereto, a supporting element mounting said slide plate within said slide housing for sliding movement against said orifice plate, and a slide guide removably attached to said slide housing for guiding the sliding movemet of said supporting element, the improvement comprising:

first attachment means for rigidly attaching said slide guide to said slide housing in the operational position thereof;



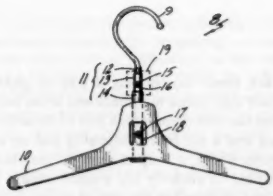
second attachment means for supporting said slide guide on said slide housing but to allow movement of said slide guide away from said slide plate when said first attachment means are released to remove said slide guide from said operational position, to thus allow removal of worn refractory elements; and

said first and second attachment means being positioned to prevent hinderance of the operation of said first attachment means by said second attachment means during the fixing of said slide guide in said operational position.

3,856,190
TELESCOPING COAT HANGER

Frank T. Mole, and Carmel E. Mole, both of 3400 Melvin Pl., Seaford, N.Y. 11783

Filed Dec. 26, 1973, Ser. No. 427,519
Int. Cl. A47j 51/10
U.S. Cl. 223—94 13 Claims



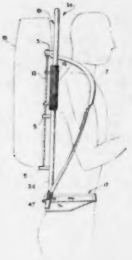
1. A telescoping device comprising in combination: first and second elements, the first being a female element and the second being a male element telescopably insertable into the female first element; the first element including in its inner wall surface a step indentation toward the outer wall thereof

stepping downwardly in a direction moving away from the point of insertion of the second element, and the second element having mounted thereon extending laterally from a side of the second element a spring-biased key means spring-biased laterally outwardly from the second element's side such that upon insertion of the second element within the first element the spring-biased key means outer end is ridable against the inner wall surface of the first element and is lockably snapable outwardly behind the step indentation securable of the second element telescopically within the first element, the first element further including a radially inwardly extending flange element and the second element further including a radially extending outwardly directed flange element with the inwardly extending flange element being aligned with and for engagement with the outwardly extending flange element such that when the spring-biased key means is not engaged lockably the male second element in the telescopingly opening thereof is not separable from within the mouth of the female first element, the improvement being that at least one of said first element's inner wall surface lateral to the step indentation and of said spring-biased key means on a lateral side portion of an outwardly directed end face surface of a lock key projection includes a wedge-inclined surface such that upon lateral or rotary twisting of one of the first and second elements one relative to the other the key projection becomes pressed radially inwardly to thereby become unlockably released from a locked state behind the downwardly stepped step indentation thus permitting the male second element to be telescopically extended within the female first element, at least the female first element being cylindrical in shape.

3,856,191
PACK FRAME

Harold J. Pohl, Washington, Mo., assignor to Kellwood Company, St. Louis, Mo.

Filed Apr. 28, 1972, Ser. No. 248,532
Int. Cl. A45f 3/10
U.S. Cl. 224—25 A **4 Claims**

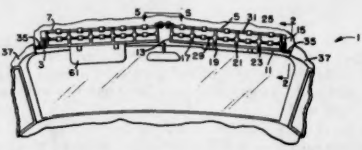


1. A pack frame comprising a pair of generally parallel, spaced-apart side frame members and cross members extending between the side members, a pair of shoulder straps for the pack frame and a hip belt comprising pad means engageable on the wearer's hips, a strap secured to the outside of the pad means adapted to encircle the wearer, means at the ends of the strap for fastening the hip belt in place on the wearer, and means for connecting a respective side member adjacent its lower end to the hip belt at each side of the belt as it is worn for transferring a portion of the weight of the load carried by the frame to the wearer's hips, said connecting means comprising at least one hole in the strap at each side of the hip belt, a hole in each side member adjacent its lower end, and a headed pin at each side of the hip belt extending through the respective hole in the strap and the hole in the respective side member for connecting each side member adjacent its lower end to the hip belt, said strap being free in part of the pad means to permit the pin to be inserted through the hole in the strap from the side thereof toward the pad means and through the hole in the adjacent side member, with the head of the pin bearing against the outside of the pad means, said pad means including a relatively thin, stiff protector member between the head of each pin and the pad means, a body of resilient, flexible foam material of such length as to extend around the wearer's back from one side to the other, and a cover enclosing the foam material, said protector member being bonded to the outside of the foam and being enclosed within the cover, and said strap being stitched to the outside of the cover, so that the pad means including said protector member, when worn by the wearer, is interposed as a cushion between said headed fastener member and the wearer and said protector member prevents gouging of the wearer by said headed fastener member.

3,856,192
STEREO TAPE CARTRIDGE RACK

Charles R. Nelson, RD No. 1, Box 128, Duanesburg, N.Y. 12056

Filed June 18, 1973, Ser. No. 371,182
Int. Cl. B60r 9/00
U.S. Cl. 224—42.1 C **5 Claims**



1. A stereo tape cartridge rack for mounting above a vehicle's windshield header, said stereo tape cartridge rack comprising sub-assemblies having bottom walls, inner and outer lateral side walls, intermediate walls, rear walls, middle ribs, middle divider strips and top divider strips defining compartments for storing stereo tape cartridges, said bottom walls being horizontally disposed, said lateral side walls being vertically upstanding from said bottom walls, said intermediate walls being vertically upstanding from said bottom walls and being between said lateral side walls, said middle ribs extending outwardly from said lateral side and intermediate walls and in transverse relationship thereto, said middle divider strips joining said middle ribs and said top divider strips joining the top portions of said lateral side walls and intermediate walls, said middle ribs being canted relative to said bottom walls, wherein said middle divider strips are coplanar with said middle ribs and wherein said top divider strips are parallel with said middle divider strips such that half said stereo tape cartridges emplaced in the storage compartments are correspondingly canted relative to the remaining emplaced stereo tape cartridges to present a wider open mouth end to facilitate grasping and removal of the stereo tape cartridges, and return and replacement of same in the storage compartments, the upper portions of said bottom walls, the inside portions of said lateral side walls, both sides of said intermediate walls, the inside portions of said rear walls, said middle ribs and the midportions of said middle divider strips and top divider strips includes means with compressible portions to guide the insertion of a stereo tape cartridge into its respective compartment by engaging the lateral sides, top, bottom and rear of the stereo tape cartridge with the thusly compressed portions of said means functioning to releasably retain the emplaced stereo tape cartridge and to prevent its rattling, said rack including mounting brackets, wherein said outer lateral side walls adjustably carry said mounting brackets and wherein

said mounting brackets are adapted to be suitably fixed to and carried by the vehicle's inside upper front window mouldings.

3,856,193

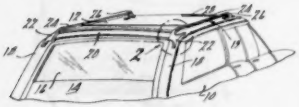
AUTOMOBILE WIND DEFLECTOR ASSEMBLY

John A. Bott, 931 Lake Shore Dr., Grosse Pointe Shores, Mich. 48236

Continuation-in-part of Ser. No. 106,803, Jan. 15, 1971, abandoned. This application Sept. 5, 1972, Ser. No. 286,572

Int. Cl. B60n *9/04*

U.S. Cl. 224—42.1 D **7 Claims**



1. A vehicle wind deflector including a blade of substantially uniform cross sectional shape and a pair of supporting brackets, each of said brackets having a socket portion and a base portion adapted to be fastened to a portion of the vehicle body, said socket portion conformably encircling one end of said blade, means on said brackets for securing the ends of said blade in said socket and a fixed elongated wall connecting said base portion and said socket portion which closes the space between said blade and the vehicle body at the opposite ends of said blade, said wind deflector comprises the rear portion of a luggage rack having a pair of opposite side rails with their rear ends supported on said wind deflector so as to be spaced above a roof portion of the automobile, said blade being oriented to deflect ambient air onto the rear window of the vehicle.

3,856,194

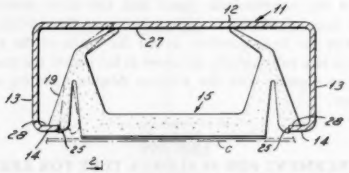
CAR TOP CARRIER ROOF OR DECK LID

Frederick A. Helm, 9818 Grinnell Ave., Detroit, Mich. 48213

Filed Dec. 26, 1973, Ser. No. 428,190

Int. Cl. B60n *9/04*

U.S. Cl. 224—42.1 D **31 Claims**



1. In a car top carrier deck, the combination comprising

a plurality of longitudinally extending strips adapted to extend along a car top,

each said strip being channel shaped and comprising a base wall, spaced side walls and longitudinally extending portions extending inwardly toward one another,

a plurality of plastic members positioned at spaced points within each said strip,

each said plastic member comprising a relatively rigid central body having an exposed surface,

relatively rigid side walls extending transversely from said central body,

relatively rigid secondary walls extending from said side walls at a point spaced from the exposed surface and toward said exposed surface,

each said relatively rigid secondary wall being connected to said side wall by an integral flexible portion,

each said secondary side wall having a free edge with a shoulder thereon receiving the inwardly extending portions of said strip,

the distance between the free edges of said inwardly extending portions of said strip being less than the distance between said shoulders when said secondary walls are in the unflexed position,

said plastic members having integral flexible portions extending from said side walls in a direction opposite from the central body portion engaging the inside of the strip and biasing the strip upwardly, and urging the inwardly extending portions of the said strip against said shoulders of said secondary walls,

the distance between said inwardly extending portions of said strip and the inner surface of the base wall of said strip being less than the distance between the shoulders and the free edges of said flexible portions when the plastic member is in the unflexed condition,

and a layer of pressure sensitive material on said exposed surface,

said exposed surface when said plastic members are in position within said strip extending outwardly beyond the adjacent edges of said inwardly extending portions of said strip such that when the pressure sensitive surface is applied to a car top, the plastic members are adhered thereto holding said strip in position.

3,856,195

MOTOR VEHICLE ODOMETER SYSTEM

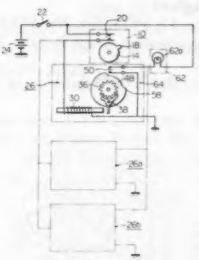
Tadao Kakizaki; Yoshiro Ichimaru, both of Yokohama, and Ryozo Arai, Sagamihara, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 21, 1973, Ser. No. 417,784

Claims priority, application Japan, Dec. 7, 1972, 47-140847

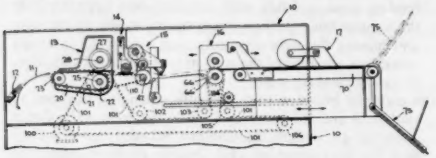
Int. Cl. G01c *22/00;* **G06f** *15/18*

U.S. Cl. 235—97 **7 Claims**



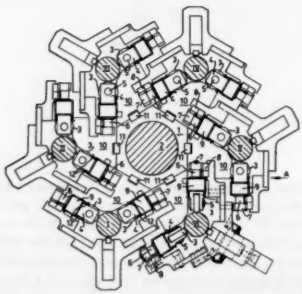
1. A motor vehicle odometer system including a total odometer and an auxiliary odometer for producing a positive alarm signal to call the vehicle driver's attention to the vehicle having been driven a selected distance at which the vehicle is due for regularly scheduled inspection and maintenance services, said total odometer comprising first electrical means to produce signals at intervals corresponding to unit distances driven; said auxiliary odometer comprising a plurality of figure wheels, a cam wheel adjustably attachable to the last figure wheel of said plurality of figure wheels, advancing means to advance said plurality of figure wheels in response to said signals, second electrical means to generate said positive alarm signal, said selected distance being preset on said auxiliary odometer which is thereafter reset, said cam wheel being attached at presetting on said last figure wheel such that when said last figure wheel is turned by said advancing means to the position representing the most significant digit of said selected distance said cam wheel turning therewith closes the circuit of said second electrical means to generate said alarm signal.

3,856,196
CAPSTAN DETACHER
Justin A. Bayne, East Rochester, N.H., and James J. Knize, Lewiston, N.Y., assignors to Moore Business Forms, Inc., Niagara Falls, N.Y.
Filed Jan. 26, 1973, Ser. No. 327,230
Int. Cl. B26f 3/00
U.S. Cl. 225—100 4 Claims



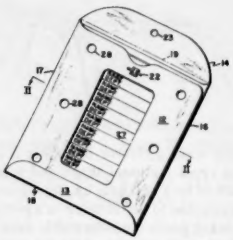
1. A machine for detaching sheets from continuous cross-perforated webs, comprising a constant tension constant speed infeed mechanism which comprises pinfeed tractor device for the web, a pair of high speed pull rolls for seizing the successive new ends of the web and bursting sheets therefrom, means for driving said pull rolls continually at a speed greater than that of the infeed mechanism, and a free-running snubber roll bearing upon the web beyond the tractor device, whereby the resistance of the web to the pulling force of the pull rolls is solely effected by the retarding effect of the constantly applied tension of the normal feed of the infeed mechanism, said snubber roll bearing the brunt of the restraining force on the web.

3,856,197
GUIDE ROLLERS
Ewart H. Doe, Houghton, Near Stockbridge, and William J. Linforth, Chandlers Ford, Near Eastleigh, both of England, assignors to Twyford Moors (Aircraft & Engineering) Limited, Eastleigh, England
Filed Dec. 11, 1973, Ser. No. 423,866
Claims priority, application Great Britain, Dec. 28, 1972, 59896/72
Int. Cl. B65h 17/22
U.S. Cl. 226—181 8 Claims



1. In a bar feeder, having a guideway and drive means, to feed bar stock material longitudinally through said guideway to a rotatable collet of a machine tool, at least one idler roller rotatable about an axis of rotation, for bearing against said bar stock material and cooperating with said drive means, mounting means for the idler roller and control means connected to said mounting means for orientating said idler roller with said axis perpendicular to the longitudinal extent of the guideway during operation of said drive means to feed said bar longitudinally through said guideway, and for orientating said idler roller with said axis parallel to the longitudinal extent of the guideway during machining of the bar by the machine tool.

3,856,198
INTEROFFICE ENVELOPE
Robert S. Daley, Worcester, Mass., assignor to Daley Inc., Worcester, Mass.
Continuation of Ser. No. 264,227, June 16, 1972, abandoned, which is a continuation of Ser. No. 34,494, May 4, 1970, abandoned. This application Aug. 27, 1973, Ser. No. 391,885
Int. Cl. B65d 27/04, 27/08
U.S. Cl. 229—71 2 Claims

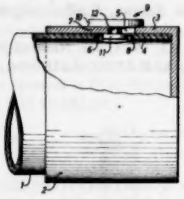


1. A dual pocket interoffice envelope composed of a unitary sheet, scored and folded to define a rectangular back panel, an intermediate panel hinged to one side back panel and folded over and against said back panel, a front panel hinged to the opposite side of said back panel and folded over and against said intermediate panel and substantially completely covering the same, the front panel and the intermediate panel acting as front and back walls of a pad pocket, said front panel having a window therein, a pad residing in the pad pocket each sheet of which is printed with indicia in registry with the window for a series of successive addresses, a bottom flap hinged to the bottom of said back panel and folded over and against said front panel, securing means on said back panel and having means thereon to cooperate with the securing means on said front panel to close not only a relatively large main pocket formed between the back panel and the intermediate panel, but also the relatively small pad pocket formed between the intermediate panel and the front panel, and spaced lines of adhesive applied between the intermediate panel and the front panel to define the limits of the second pocket to size substantially the same as the pad to maintain the indicia in registry with the window despite handling of the envelope.

3,856,199
ARRANGEMENT FOR SEALING A TUBE FOR KEEPING DOCUMENTS OR SIMILAR CONTAINER
Kaj G. Gartz, Tullinge, Sweden, assignor to K. G. Hansson AB, Tullinge, Sweden
Filed Aug. 1, 1972, Ser. No. 276,947
Int. Cl. B65d 3/04, 3/10
U.S. Cl. 229—93 7 Claims

1. An arrangement for sealing a capped container, particularly a tube for documents, comprising a cap fully seated on the container, a wall portion of said cap and a wall portion of said container being in overlapping relationship, an abutment on one of said container and said cap for limiting the overlap of said wall portions, openings of a given size in each of said wall portions in partial alignment with one another, said container opening having a resilient edge portion partially overlying said cap opening and said cap opening having an edge portion partially overlying said container opening thereby forming a passageway between openings of a size smaller than the size of each opening, a rigid locking member having spaced first and second heads interconnected by a shank, said

second head being of a size smaller than each opening and larger than the passageway, and said first head being of a size larger than each opening, said second head lying wholly within said container opening as it bypasses said cap opening edge portion by deforming said resilient edge portion, said second head also underlying said cap opening edge portion, and said



first head overlying said cap opening, whereby said abutment prevents relative sliding movement of said wall portions in one direction, and contact between said shank and said cap opening edge portion and between said second head and said resilient edge portion prevents relative sliding movement of said wall portions in an opposite direction.

3,856,200

DAMPING DEVICE FOR RAPIDLY SPINNING ROTARY BODY

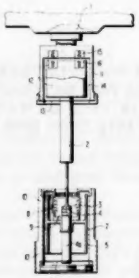
Helmut Lieb, Unterhaching, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg AG, Munich, Germany

Filed May 11, 1972, Ser. No. 252,192

Claims priority, application Germany, May 13, 1971, 2123654

Int. Cl. B01d *21/26*

U.S. Cl. 233—1 C **10 Claims**



1. A device for damping a rapidly spinning rotary body supported in a damped thrust bearing means, which includes a housing nearly completely filled with a damping oil arranged between the rotary body and the thrust bearing means and positively coupled with the rotary body, and a damping means immersed in said housing, said damping means being movably connected with the housing and being movable against a restoring force relative to the housing, and the housing being connected, by way of a flexible support means, with a bearing pin which is carried in the thrust bearing means and axially supports the damping means, characterized by a system of magnets arranged in both the housing and the damping means including magnet means forming two magnetized poles of the same sign which are disposed mutually opposite one another.

3,856,201

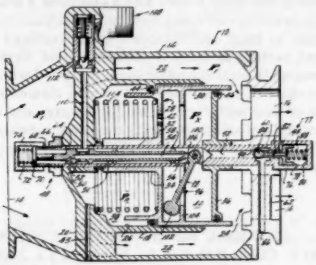
TEMPERATURE REGULATING CONTROL VALVE

David C. Genever-Watling, Forest Park, and Howard B. Kast, Fairfield, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Sept. 5, 1972, Ser. No. 286,271

Int. Cl. G05d *23/00*

U.S. Cl. 236—93 **7 Claims**



1. A high temperature fluid control valve consisting of

a housing defining an inlet, an outlet, and a first piston chamber;

a thermal regulating piston positioned within said chamber, said piston cooperating with said housing to define a variable flow orifice between said inlet and said outlet;

a temperature responsive servo for controlling the pressure on a first face of said piston, said servo forming a portion of a mechanically unloaded control bleed loop around said variable flow orifice, and feedback means connected between said piston and said servo.

3,856,202

TRACK ELEMENT FOR LINEAR MOTOR VEHICLES AND A TRACK USING SUCH AN ELEMENT

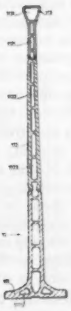
Francois Colas, 10 Avenue de Petit Chambord, Bourg-la-Reine, and Claude Gregorian, 4 Allee Racine, Sevran, both of France

Filed Dec. 1, 1972, Ser. No. 311,109

Claims priority, application France, Dec. 1, 1971, 71.43129

Int. Cl. E01b *11/00, 25/00*

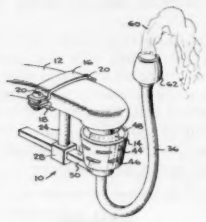
U.S. Cl. 238—122 **8 Claims**



1. An assembly of track elements adapted to provide guide and traction means for a linear motor vehicle of the type

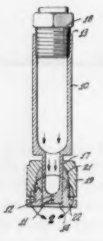
carrying an inductor for cooperation with armature means associated with the track, each said element comprising a vertically extending limb, cavities defined by said limb at the ends thereof, a tubular bead-shaped portion of transverse rigidity extending along the top of said limb, cavities defined by said tubular portion at the ends thereof, at least some of the cavities in said limb and in said tubular portion comprising passages extending along the length thereof, means for joining the elements end-to-end to form the track, said joining means comprising fish-plate means which comprise a sealing joint of resilient material extending between the adjacent ends of said elements, at least one fish-plate being received within two adjacent cavities in a lower section of said elements and at least one additional fish-plate being received within the adjacent cavities of tubular portions of said elements, the upper section of said limb forming said armature, and wherein the exterior walls of said upper section diverge outwardly from the top of said limb at an angle between 2° and 5° relative to each other.

3,856,203
DRINKING FOUNTAIN ATTACHMENT
Charles F. Clark, P.O. Box 86, Roanoke, Va. 24002
Filed Oct. 31, 1973, Ser. No. 411,203
Int. Cl. E03b 9/20
U.S. Cl. 239—27 **6 Claims**



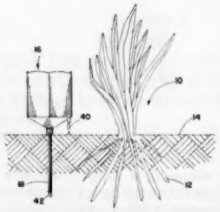
1. A drinking fountain attachment connectable to a conventional water discharge pipe of the type extending horizontally and having a downward facing water discharge opening, said attachment comprising clamp bracket means dimensioned to clampingly fit over the horizontal portion of a water discharge pipe at a location upstream from said downward facing discharge opening, support rod means extending from said clamp bracket means, an upwardly flaring conical flow directing cup supported on one end of said support rod means, said flow directing cup being open on its upper end and including a conical side wall including a plurality of openings for permitting the egress of excess water and pressure in said cup and an outflow opening in its lowermost portion, conduit means comprising a plastic tube member having an embedded wire enabling an easy manipulation of said conduit to a desired position in which the conduit will remain until subsequently repositioned and having one end connected to said outflow opening and an opposite end spaced transversely from said flow directing cup facing upwardly so that water flow directed by said flow directing cup into the end of said conduit is projected upwardly out of said other end in a fountain-like manner and pivotal connector means including a pivot pin supported for rotation about its axis in an opening in said bracket means pivotally connecting said support rod means to said bracket means for swinging movement of said support rod means in a horizontal plane so that said support rod can be positioned in a first position in which said flow directing cup is spaced beneath said discharge opening of said pipe in alignment with said discharge opening to receive water from said discharge opening and an inoperative position transversely spaced away from beneath said discharge opening so as not to interfere with normal operation of said water discharge pipe wherein said support rod means is connected to said pivot pin by means of a rod clamp housing portion on the lower end of said pivot pin defining an aperture in which said support rod is slidably positionable and holding means engageable with said support rod for maintaining said support rod in an adjusted position.

3,856,204
GAS EMITTING DEVICE
Ramesh Chand, Santa Susana, Calif., assignor to Ecology Board, Inc., Los Angeles, Calif.
Filed Mar. 12, 1973, Ser. No. 340,300
Int. Cl. A24f 25/00; A61l 9/04
U.S. Cl. 239—34 **29 Claims**



1. A device for emitting a gaseous substance at a predetermined rate, comprising:
a sealed vessel for holding said substance under pressure, said vessel being impermeable to said substance and having an exit for emission of said substance; and
a quantity of permeable polymeric silicone material positioned in said exit, said material having a permeability which decreases with increasing temperature and constant pressure in said vessel, whereby said substance permeates through said material and is emitted from said vessel at the predetermined rate, and said device has a characteristically low overall sensitivity to temperature variations.

3,856,205
PLANT WATERING DEVICE
Hermann Rohling, 4160 Pearl Rd., Cleveland, Ohio 44109
Filed July 18, 1972, Ser. No. 272,847
Int. Cl. A01g 25/00; B05b 1/30
U.S. Cl. 239—63 **10 Claims**



1. A plant watering device comprising,
a container having an upwardly opening fill passage for receiving water,
said passage extending through the otherwise imperforate top of said container and including structural means for preventing air flow into the container through said passage subsequent to filling said container with water, said container including sidewalls extending from said wall to a bottom,

said container being supported such that it is above the lowest extent of the roots of the plant it is to water;

a standpipe projecting from below through the bottom of the container and extending upward within said container, said standpipe being hollow and defining a fluid passage from one end to the other;

a tube for placing in fluid communication with a point in the soil near the lowest extent of the roots and extending into the container and terminating above the upper level of the standpipe;

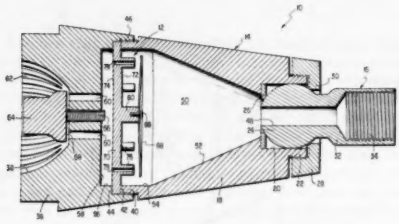
a discharge passage having its inlet near the bottom of the container,

said discharge passage extending upward and then downward to connect in fluid communication with the lower part of said standpipe.

3,856,206
THERMOSENSITIVE FLOW CONTROL DEVICE

Edward H. Bell, and John R. Bell, both of Monogahela, Pa., assignors to American Standard Inc., New York, N.Y.

Filed July 26, 1973, Ser. No. 382,734
Int. Cl. A62c *37/00, 37/34*
U.S. Cl. 239—75 **15 Claims**



1. A flow control device which retards flow of a liquid stream when the stream temperature exceeds a predetermined first temperature and which restores full flow when the stream temperature drops to or below a predetermined second and lower temperature, said device comprising:

a flow head connected to said liquid stream;

flow port means in said head through which said liquid stream flows;

a temperature responsive disc connected to said flow port means and positioned a preselected distance therefrom when said stream temperature is less than said predetermined first temperature, to permit full stream flow through said flow port means;

said disc having at least a portion thereof free for flexural movement toward and away from said flow port means with such flexural movement occurring in response to temperature variations in said liquid stream;

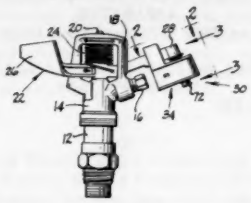
said disc arranged and constructed to be flexed toward said flow port means when said stream temperature exceeds said predetermined first temperature, to partially close said flow port means to provide a controlled reduced stream flow through said flow port means;

said disc portion arranged and constructed to be flexed away from said flow port means and returned to its predetermined spacing at said preselected distance from said flow port means when said stream temperature drops to or below said predetermined second and lower temperature, whereupon full stream flow through said port means is restored.

3,856,207
SPRAY DEFLECTOR AND ARRANGEMENT FOR ROTATABLE SPRINKLERS

Charles E. Rees, Jr., Fresno, Calif., assignor to Johns-Manville Corporation, Greenwood Village, Colo.

Filed Oct. 12, 1973, Ser. No. 405,953
Int. Cl. B05b *3/02, 3/14*
U.S. Cl. 239—230 **20 Claims**



1. In a rotatable sprinkler including a sprinkler jet and an oscillatable arm projecting beyond and at one side of said jet, a water deflector arrangement, comprising:

a. a cylindrical pin connected with and extending from said oscillatable arm, said pin being movable into the path of water issuing from said jet;

b. a water deflector having a front end, a back end, opposite top and bottom surfaces extending between said front and back ends and opposite side surfaces extending between said ends, said deflector including a passageway extending therethrough from said top surface to said bottom surface;

c. said cylindrical pin extending through the passageway of said deflector such that

i. said deflector is pivotally movable about said pin,

ii. the front end of said deflector faces substantially away from said sprinkler jet, and

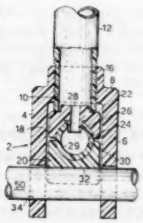
iii. at least one of the side surfaces of said deflector is adapted to deflect water issuing from said jet when said pin moves into the path;

d. said passageway including a longitudinal segment through which a longitudinal portion of said pin passes, said passageway segment having a predetermined cross-sectional configuration such that those surfaces of said pin portion which face the front and back ends of said deflector during pivotal movement of said deflector are at all times out of contact with said deflector.

3,856,208
SUPPORT AND COUPLING FOR WATER SPRINKLERS

Natan Naftaly, 27 Ousha St., Kiryat Mozkin, Israel

Filed Aug. 3, 1973, Ser. No. 385,256
Int. Cl. B05b *3/06*
U.S. Cl. 239—251 **8 Claims**



1. A support and coupling device for water sprinklers and the like, including a housing for receiving a water distribution line and a water sprinkler pipe, and a connector for connecting the water distribution line to the water sprinkler pipe,

characterised in that the housing further includes a stabilizing tube having a straight portion rotatably adjustable within the housing, and a bent end the tip of which is adapted to engage the ground for steadily supporting the housing on sloping or uneven ground.

3,856,209

PRESSURE SPRAY CAN HOLDING AND OPERATING APPARATUS

John D. Hickson, 5986 - 17A Ave., Beach Grove, Delta, B.C., Canada

Filed Jan. 7, 1974, Ser. No. 431,354
Int. Cl. B05b *15/06*
U.S. Cl. 239—532 **13 Claims**

1. Apparatus for holding and operating pressure spray cans holding liquid under pressure and having at one end an outlet controlled by a normally-closed valve, said valve being movable to open the can outlet to permit liquid to spray therethrough, comprising an elongated handle, a carrier swingably mounted on the handle near an end thereof for movement between a position substantially parallel to the handle and a position substantially normal thereto, securing means for holding the carrier in any adjusted position relative to the handle, gripping means on the carrier for holding a spray can thereon, an operating pin, holding means retaining the pin in a position adjacent the valve of the can on the carrier, said pin being movable relative to the holding means, cable means connected to said operating pin and extending therefrom to near an opposite end of the handle, said cable means permitting swinging movement of the carrier, and a trigger mounted on the handle near said opposite end and connected to said cable means and operable to cause through said cable means movement of said pin into engagement with said valve, thereby causing liquid to spray through the can outlet.

3,856,210

FLAIL TYPE MATERIAL SPREADER

James H. Hodgson, Vinton, Iowa, assignor to Chromalloy American Corporation, St. Louis, Mo.

Filed Jan. 28, 1974, Ser. No. 436,967
Int. Cl. A01c *3/06, 15/14*
U.S. Cl. 239—658 **11 Claims**

1. In a material spreader of the type which has a container generally in the form of the bottom half of a cylinder with parallel end walls, a shaft journalled on the axis of said cylinder, flexible flails on said shaft, and means for driving said shaft so the flails discharge material over a first side of said container, a spreader upper structure comprising, in combination:

an upper side panel surmounting the second side of said container, said upper side panel having a plurality of angularly related planar portions all of which lie outside but closely adjacent to a cylindrical projection of said half a cylinder, the two uppermost of said portions defining a side and top of a recess which is open toward the first side of the container and forming a rigidifying beam;

upper end panels surmounting the end walls, said upper end panels having nearly horizontal top edges;

means connecting said upper end panels to said upper side panel;

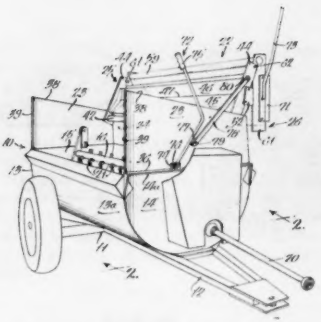
opposed pivot bosses on the end panels which extend into said recess;

a cover which includes

a pivot tube journalled on said pivot bosses,

a sheet metal body which has a first marginal portion secured to said pivot tube,

a plurality of angularly related planar body portions all of which lie outside of but closely adjacent to said cylindrical projection, a free marginal body portion having angularly related parts defining a pocket which is close to the apex of the container and which is open toward the first side of the container,



and parallel upright flanges at the ends of said cover which project beyond the open side of said pocket;

interengaging means on the cover end flanges and on the upper end panels to support the cover in closed position;

a cover extension pivotally mounted on the projections of the cover end flanges outside the pocket, said cover extension including

a tube which is below said pivotal mounting and partly within said pocket in spaced relationship to the cover parts that define the pocket,

a sheet metal body which has a first marginal portion secured to the upper part of said tube,

a plurality of angularly related planar body portions including a marginal portion forming an upstanding flange,

and parallel upright end plates including means resting on the top edges of the end panels when the cover extension is closed,

and lever means at an end of the spreader for moving said cover extension and said cover between their closed and open positions,

said cover extension being rotatable by said lever means on its pivotal mounting to an open position resting on the upper webs of the support brackets,

and the cover being rotatable on the pivot bosses by said lever means, when the cover extension is open, to an open position inclined outwardly from the vertical.

3,856,211

MATERIAL SPREADER UTILIZING PLUG-IN MATERIAL CONTAINER

Marvin E. Williams, Marysville, Ohio, assignor to The O. M. Scott & Sons Company, Marysville, Ohio

Filed Feb. 16, 1972, Ser. No. 226,822
Int. Cl. A01c *17/00*
U.S. Cl. 239—685 52 Claims

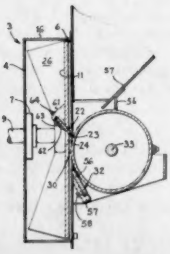
1. A material spreading combination, comprising a wheeled spreader unit and a separate material container-hopper means, said spreader unit comprising: means for receiving and maintaining said container-hopper means in a predetermined disposition on said spreader unit and for simultaneously enabling discharge of material from a lower portion of said container-hopper means; a rotary material spreading device having a powered drive connection providing rotation during spreader unit operation; and material flow directing means adjacent said container-hopper means lower portion for receiving and passing material from said container-hopper means during spreader operation to said rotary material spreading device, whereby said container-hopper means is a separate, material container when dissociated from said spreader unit and is a hopper when received on said spreader unit, during said spreader operation.

3,856,212

FEEDING ASSIST MEANS FOR A WOOD CHIPPER

Albert Swatko, Kingston, Pa., assignor to Royer Foundry and Machine Co., Kingston, Pa.

Filed Aug. 2, 1973, Ser. No. 385,185
Int. Cl. B02c *23/02*
U.S. Cl. 241—56 6 Claims



1. In a wood chipping device having a rotatable disk, cutting knives on a face thereof and openings through said disk at locations adjacent the cutting edges of said disk, air blast creating means on the side of the disk opposite said knives for drawing a current of air through said openings and expelling said air and said chips through discharge means, the improvement comprising feeding assist and anvil means comprising:

a freely rotatable roller positioned closely adjacent a surface of said disk spaced therefrom sufficiently to clear said knives and form an anvil means for said knives and a mounting device for supporting same rotatably about an axis substantially perpendicular to the direction of travel of said knives at the moment of cutting;

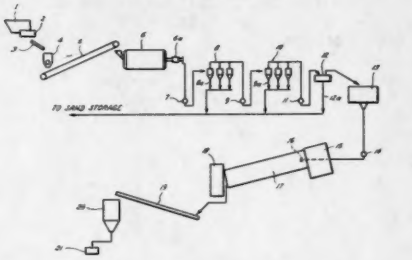
means substantially tangent to said roller and forming an acute angle to the face of said disk for guiding workpieces against said disk for chipping thereof.

3,856,213

METHOD OF PRODUCING KAOLIN CLAY FROM ORE HAVING SILICA SAND CONTENT

Lucius B. Dulaney, Houston, Tex., and Erwin F. Theobold, Sutter Creek, Calif., assignors to Kaolin Corporation, Sutter Creek, Calif.

Filed Apr. 12, 1973, Ser. No. 350,399
Int. Cl. B02c *21/00*
U.S. Cl. 241—4 3 Claims



1. A method of recovering kaolin clay from raw ore having a silica sand content in quantities that inhibit air separation of the silica sand from the kaolin clay comprising the steps of:

a. preparing a slurry of the ore;

b. moving the ore slurry to reduce the particle size of the kaolin clay to substantially the normal particle size present in the raw ore;

c. separating the silica sand from the kaolin clay slurry; and

d. drying the kaolin clay slurry wherein the drying atmosphere temperature is not greater than approximately 1,100°F. and the exposure time of the kaolin clay slurry in such heated atmosphere is not longer than approximately 30 seconds.

3,856,214

MATERIAL PULVERIZING SYSTEM

Robert Paul Kaltenbach, Worcester, and Wayne C. Rogers, West Boylston, both of Mass., assignors to Riley Stoker Corporation, Worcester, Mass.

Filed Jan. 4, 1974, Ser. No. 430,906
Int. Cl. B02c *25/00*
U.S. Cl. 241—34 33 Claims

1. A material pulverizing system comprising

a power operated pulverizing mill for providing a pulverized material output in response to a variable mill output demand signal,

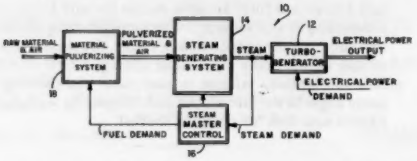
means for feeding pulverizable material to said mill at a variably controlled feeding rate and

means for automatically controlling the feeding rate of said feeding means, said automatically controlling means comprising

first means for generating a first electrical signal indicative of the power consumed by said mill,

second means for generating a second electrical signal indicative of the sonic intensity of said mill,

third means for generating a third electrical signal indicative of said mill output demand signal and



fourth means for generating an output control signal for controlling the feeding rate of said feeding means in response to said first, second and third electrical signals.

3,856,215

ENCRUSTATION-PREVENTING DEVICE FOR FLUID ENERGY TYPE MILLS

Edward Van Vliet, Doylestown, Pa., assignor to Fluid Energy Processing & Equipment Company, Hatfield, Pa.

Filed Oct. 23, 1973, Ser. No. 408,451
Int. Cl. B02c *19/06*
U.S. Cl. 241—39 **10 Claims**

1. In a centrifugal type grinding mill wherein granular material is centrifugally passed through the mill in a vortex action by gaseous fluid whereby the particles pulverize each other and are then centrifugally separated into smaller and larger particles, and wherein the smaller particles are centrifugally exhausted through an outlet duct, the improvement comprising an anti-encrustation assembly which comprises a screen in said outlet duct, said screen having a cross-sectional contour conforming to the interior cross-sectional contour of the duct but being radially inwardly spaced from the interior wall surface of said duct, and fluid delivery means to deliver gaseous fluid between said screen and said interior wall surface of said duct in a manner to propel said gaseous fluid radially inward through said screen.

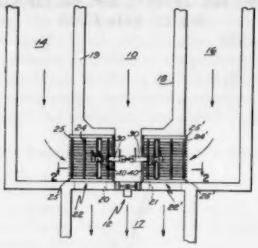
3,856,216

SYSTEM AND APPARATUS FOR CLEANING BAR GRID

Roger W. Teague, and Richard Paul Snyder, both of Largo, Fla., assignors to General Signal Corporation, New York, N.Y.

Division of Ser. No. 275,914, July 28, 1972,. This application July 11, 1973, Ser. No. 378,139
Int. Cl. B02c *18/40*
U.S. Cl. 241—46 R **4 Claims**

1. In a system including a flume in which waste material flows, a grid for separating and retaining large solid particles of waste matter from said waste material and a disintegrator for reducing the size of said solid particles, the improvement comprising a plurality of vertical walls providing at least two individual inlet channels and a common discharge channel, one inlet channel terminating in a wall containing a disintegrator, the other inlet channel directing the flow through the grid,



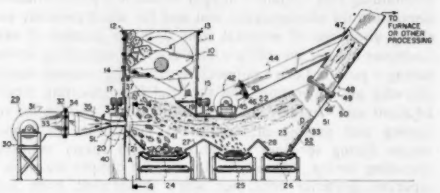
said disintegrator and said grid discharging into said common discharge channel, said grid having an automatic rake mechanism for periodically removing said solid particles from said grid and directing said particles to said disintegrator.

3,856,217

COMBINATION SHREDDER AND AIR-CLASSIFICATION EQUIPMENT

John C. Brewer, Salt Lake City, Utah, assignor to Garbalizer Corporation of America, Salt Lake City, Utah

Filed June 4, 1973, Ser. No. 366,987
Int. Cl. B02c *13/06*; **B07b** *4/02*
U.S. Cl. 241—79.1 **3 Claims**



1. In combination, revolving blade means for shredding materials including metals in pieces; means disposed immediately and essentially vertically beneath said shredding means for directly receiving and air-classifying said pieces, including metals, into a plurality of groups progressively spaced from said air-classifying means, which groups are of essentially differing characteristic weights, the progressively lighter of said groups being progressively farthest removed from said air-classifying means, said air-classifying means including means for producing a vertically thin, horizontally elongate stream of classifying air, and means proximate said air-classifying means for separately receiving said groups, wherein said separately receiving means comprises plural, parallel, endless belt-type conveyors having respective, corresponding, opposite side edge margins, and wherein said combination includes upwardly convex divider means overlapping corresponding side edge margins of said conveyors.

3,856,218

WASTE REDUCTION APPARATUS

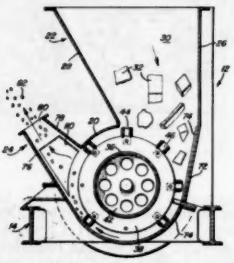
Grady R. Harmon, Lafayette; John D. Norman, and Guy M. Tadlock, both of Auburn, all of Ala., assignors to R. Bogan Renfroe and Harmon Engineering, both of Atlanta, Ga., part interest to each

Filed Nov. 21, 1972, Ser. No. 308,546
Int. Cl. B02c *13/04*, *13/288*
U.S. Cl. 241—186 R **8 Claims**

1. A solid waste reduction apparatus comprising, in combination:

a. a housing support means constructed to include a horizontally oriented, substantially cylindrical shaped portion defining a material reduction area, said housing including horizontally spaced, upwardly projecting wall means defining a vertically oriented material entrance passageway, said passageway detailed in location whereby material can flow by gravity through said passageway into said material reduction area, and wherein said housing includes a material discharge passageway projecting substantially radially from said cylindrical shaped portion;

b. a cutting assembly rotatably supported in said material reduction area, said cutting assembly including a plurality of axially spaced circular discs, with each disc having a plurality of cutting elements pivotally supported and circumferentially spaced adjacent the edge of said disc,



said disc detailed in shape and location to provide a rotary supporting surface beneath and adjacent the bottom of said material entrance passageway for supporting material to be automatically fed by gravity during a cutting operation, said cutting elements detailed in size and location to be capable of pivotal movement to an inoperable cutting position completely within the circumference of said disc and movement to an operable cutting position projecting radially from said disc; and,

c. anvil means supported on said housing for coperation with said cutting elements for effecting a reduction of material introduced through said entrance passageway, said anvil means including a plurality of anvil elements, one anvil element axially spaced and aligned with each of said discs and detailed in length to extend to a position adjacent the circumferential edge of said disc.

3,856,219

BONE MILL

LeRoy M. Stayton, and Theodore L. Herling, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 29, 1972, Ser. No. 293,735

Int. Cl. B02c *1/00*; B26d *1/10*

U.S. Cl. 241—263 **2 Claims**

1. A bone mill for converting cadaver bone into controlled size fragments comprising:

a bone supply channel;

a weighted feed rod located within said channel for pressing against a cadaver bone;

said rod fitting closely within said channel;

a shear channel perpendicularly intersecting said bone supply channel to form an aperture of constant cross section extending through the opposite walls of said bone supply channel;

a serrated shear bar having a set of teeth of stair-step configuration slidably movable within said shear channel and through said aperture;

means for reciprocating said bar to move completely across said bone supply channel for causing the interaction of said teeth and the bottom edge of said supply channel against a bone to shear the bone into controlled size fragments;

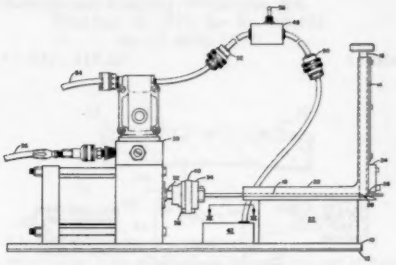
said reciprocating means comprising

an air cylinder including a two-way piston shaft;

a pair of magnetic reed switches;

a linear alignment coupler connecting said piston shaft and said bar;

a magnet attached to said coupler for alternatingly actuating said reed switches;



said reed switches being parallel to and adjacent the movement of said magnet;

a valve on either side of said piston shaft for introducing compressed air into said cylinder; and

a solenoid associated with each said valve for opening and closing said valves in response to an electrical signal from said reed switches.

3,856,220

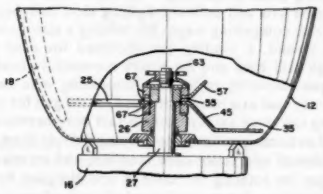
BLADES FOR FOOD PREPARING MACHINE

Barrett Bradford Waters, Sheridan, Wyo., assignor to The Hobart Manufacturing Company, Troy, Ohio

Filed Mar. 26, 1973, Ser. No. 345,207

Int. Cl. B02c *18/12*

U.S. Cl. 241—282.1 **6 Claims**



1. In an apparatus for comminuting and mixing materials, including a container having a bottom wall surrounded by a side wall, a drive shaft rotatably passing through the bottom wall, and a motor drivably connected to the rotatable shaft for rotation thereof, this improvement comprising:

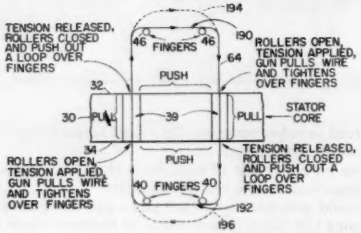
a. an upper knife blade and a lower knife blade mounted on the shaft adjacent the bottom wall of the container, said upper knife blade having a beveled leading edge surface portion facing generally the bottom wall, and said lower knife blade having a beveled leading edge surface portion facing away from the bottom wall to effect optimum mixing and comminuting of material within the container, and

b. a third knife blade mounted on the shaft above said upper blade and having a portion projecting upwardly at an inclined angle relative to said upper knife blade, said upwardly projecting portion having a radial extent approximately one-fourth that of said lower knife blade and including a beveled leading edge surface portion.

3,856,221
PUSH-PULL STATOR WINDING APPARATUS AND METHOD

Robert E. Arick, Fort Wayne, Ind., and Ralph A. Vogel, Three Rivers, Mich., assignors to Essex International, Inc., Fort Wayne, Ind.

Filed Sept. 4, 1973, Ser. No. 394,323
Int. Cl. H02k *15/085*
U.S. Cl. 242—1.1 R 24 Claims

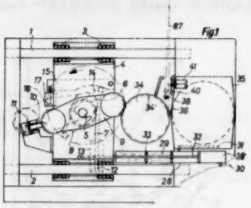


1. In apparatus for winding dynamoelectric machine stator core members which have opposite sides and radially inwardly extending polar projections with inner ends defining a bore having an axis and defining winding slots therebetween, said apparatus comprising means for holding a stator core member to be wound, a winding gun mounted for axial movement through said bore and for rotary movement about said axis, said gun including means for dispensing wire radially with respect to said axis, means coupled to said gun for reciprocally moving the same axially through said bore between predetermined extreme positions spaced respectively from said opposite sides of said stator core member, and means coupled to said gun for rotating the same in one direction between first and second predetermined angularly spaced positions respectively aligned with two of said slots when said gun is on one side of said stator core member and in the opposite direction between said angularly spaced positions when said gun is on the other side of said stator core member whereby wire dispensed by said dispensing means forms a coil with side portions respective in said two slots and with end turn portions respectively on said opposite sides of said stator core member and connecting said side portions; the improvement comprising means for feeding wire from a source to said dispensing means including selectively actuable means for withdrawing wire from said source and for pushing the same through said dispensing means at a linear rate faster than the rate of movement of said gun, and means for actuating said withdrawing and pushing means during formation of said end turns and deactivating the same during dispensing of wire into said slots, whereby said gun and dispensing means pulls wire from said source during dispensing thereof into said slots and said wire is pushed at a faster rate during formation of said end turns initially to form enlarged end turn loops which thereafter are pulled behind previously formed end turns.

3,856,222
METHOD OF AUTOMATICALLY CHANGING WINDING TUBES AND WINDING APPARATUS FOR IMPLEMENTING THE AFORESAID METHOD AND IMPROVED SPOOL DOFFING MECHANISM

Olivier Wust, Seuzach, Switzerland, assignor to Rieter Machine Work Ltd., Winterthur, Switzerland

Continuation-in-part of Ser. No. 76,181, Sept. 28, 1970, abandoned. This application Apr. 13, 1973, Ser. No. 350,793
Claims priority, application Switzerland, Oct. 3, 1969, 15021/69; Jan. 22, 1973, 854/73; Feb. 2, 1973, 1547/73
Int. Cl. B65h *54/06*
U.S. Cl. 242—18 A 66 Claims



1. A method of automatically changing two tubes, each of which have been positioned upon a respective mandrel arranged on a movable member and rotatable such that said tubes alternatingly contact a friction drive drum for taking up an endless thread delivered at high speed in a winding device, comprising the steps of rolling the full package wound upon one of the tubes during such time as the desired package size is reached along the friction drive drum in the sense of an extension of the thread path on said friction drive drum and until the other tube which is empty contacts the friction drive drum, prior to such contact of the other empty tube with the friction drive drum axially displacing the mandrel carrying the empty tube in the direction of its free end to bring a thread catching and severing zone within a thread traversing range, accelerating such empty tube due to its contact with the friction drive drum, lifting the full package off the friction drive drum while the thread is still being wound thereon due to the inertia of the full package, unthreading the thread from a thread traversing guide, deflecting the thread passing from the friction drive drum to the full package which has been lifted out of contact with the friction drive drum such that the deflected thread passes through said rotating catching and severing zone of the mandrel supporting the empty tube, thereafter catching and severing the connecting thread between the full package and the empty tube by means of the rotating catching and severing zone, and placing a number of reserve wraps onto the empty tube by axially moving such tube into a normal winding position while rolling such empty tube along the friction drive drum.

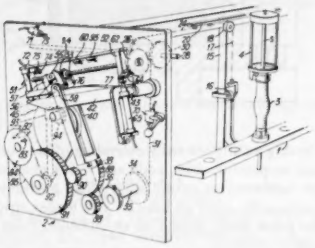
3,856,223
WINDING MACHINE

John K. P. Mackie, Belfast, Northern Ireland, assignor to James Mackie & Sons Limited, Belfast, Northern Ireland

Filed Feb. 29, 1972, Ser. No. 230,235
Claims priority, application Great Britain, Mar. 10, 1971, 6475/71
Int. Cl. B65h *54/36*
U.S. Cl. 242—26.3 7 Claims

1. In a multihead winding machine for the winding of material delivered from a controlled speed source of supply, having a plurality of winding heads, each said winding head comprising a rotary guide, a non-rotary package support and means for driving said rotary guide around said support; traverse mechanism common to a plurality of winding heads to produce a relative axial traversing motion between each said

rotary guide and said respective package support, said traverse mechanism including a lever arm mounted to rock about a fulcrum, means for progressively reducing the stroke of said traversing motion at either of two predetermined rates of reduction, and control means manually operable while said driving means is in operation to change the rate of reduction produced by said stroke reducing means from one of said predetermined rates to the other, whereby the higher of said predetermined rates may be applied during the period of winding when completed packages are being doffed and fresh



packages started, said control means comprising a pressure-actuated cylinder connected to actuate said stroke-reducing means and to be actuated through a pneumatic circuit having two branches, a source of fluid pressure, a change-over device whereby said branches may be alternatively connected between said cylinder and said source, one of said branches including first valve means operated by rocking movement of said lever arm, and the other of said branches including second valve means, and means for operating said second valve means more rapidly than said first valve means.

3,856,224

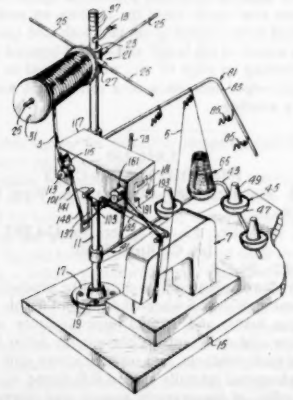
SEWING APPARATUS

Hendrik Van der Aa, and Johan Van der Aa, both of Perrefonds, Quebec, Canada, assignors to Movatex Products Ltd., Ste-Anne-de-Bellevue, Quebec, Canada

Filed July 31, 1972, Ser. No. 276,860

Int. Cl. B65h *75/02*

U.S. Cl. 242—55 **18 Claims**



1. Apparatus suitable for use in sewing tapes to fabric with thread in a sewing machine, the apparatus comprising a substantially vertically extending support member, mounting means on the member for mounting at least one rotatable collar, a plurality of arms extending radially from said collar for carrying tape reels, means for indexing said collar, means on the member for supporting a plurality of thread bobbins, and means on the member for supporting thread tensioning and guide means.

3,856,225

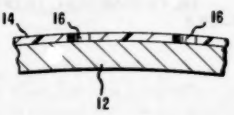
ABSORBENT YARN BOBBIN

Rhodes Ebeling Wray, Staunton, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 18, 1971, Ser. No. 190,108

Int. Cl. B65h *75/10*

U.S. Cl. 242—118.32 **6 Claims**



1. A textile yarn support comprising:

an imperforate core of absorbent material having an outer surface; and a plastic material having perforations therethrough adhered to said outer surface, said plastic material constituting a winding surface for the yarn.

3,856,226

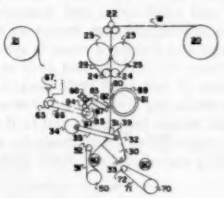
METHOD AND APPARATUS FOR CORELESS SPOOL PRODUCTION

Daniel J. Dowd, Jr., Clifton Forge, Va., assignor to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 216,629, Jan. 10, 1972, Pat. No. 3,802,639. This application Dec. 10, 1973, Ser. No. 424,343

Int. Cl. B65h *17/02*

U.S. Cl. 242—56 R **13 Claims**



1. An apparatus for winding coreless spools of thin web material from a substantially continuous supply thereof, said apparatus comprising:

supply means for dispensing an indefinite length of thin web material having substantially uniform width along a material flow path having a substantially fixed portion thereof;

cyclically positionable deflector means for directing said web along one of at least two distribution flow paths;

cutting means disposed between said supply means and said deflector means for severing said web across the width thereof at substantially uniform length intervals;

substantially cylindrical, axially rotatable mandrel means proximately disposed at the terminal end of each distribution flow path for receiving said uniform lengths of web directed thereto by said deflector means, each of said web lengths being wound about said mandrel with a plurality of wraps to form a spool; and,

fluid ejection means for removing said spool from the proximity of said mandrel comprising pressurized fluid supply means and a plurality of fluid discharge apertures disposed about the wrapping surface of said mandrel, said apertures being in communication with said fluid supply means and disposed at an angle to the mandrel axis whereby the discharge of pressurized fluid from said

apertures expands said spool from substantial surface contact therewith and propels said spool over one axial end of said mandrel.

3,856,227

DEVICE FOR THE CONTINUOUS FEEDING OF A MACHINE WITH A STRIP UNWOUND FROM SUCCESSIVE REELS

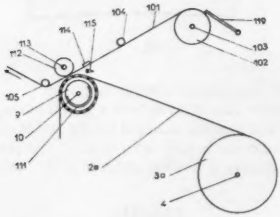
Jean-Claude Gouy, Chaville, France, assignor to Service D'Exploitation Industrielle Des Tabacs Et Des Allumettes, Paris, France

Filed Apr. 27, 1972, Ser. No. 247,945

Claims priority, application France, Apr. 30, 1971, 71.15616

Int. Cl. B65h *19/04, 19/16*

U.S. Cl. 242—58.3 **8 Claims**



1. A device for feeding a machine with a feed strip unwound from a feed reel, comprising a drum member having a free end portion and adapted to receive at least two refill reels on each of which is wound a refill strip, means for moving successively each of said refill reels and bringing said reels successively at the end portion of said drum member and at the place of the preceding reel, respectively, means for receiving the free end of each of said refill strips and maintaining said ends at standby close to said feed strip, means for accelerating one of said refill strips and making it move in synchronism with said feed strip, means for moving said ends in synchronism with said movement of said refill reels towards said accelerating means and transferring said ends successively onto said accelerating means, means for joining said feed strip to the leading end of each said refill strips successively, and means for cutting the leading end of said one refill strip.

3,856,228

TAPE REEL

Hiroo Hosono; Seiko Minamide, both of Osaka; Juichi Hukushima; Yoku Kudou, both of Neyagawa, and Shunichiro Kimura, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

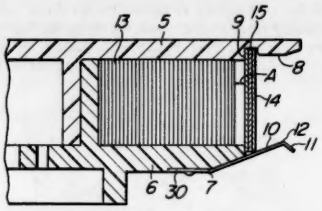
Division of Ser. No. 131,351, April 5, 1971, Pat. No. 3,797,777. This application Jan. 2, 1974, Ser. No. 430,183

Claims priority, application Japan, Apr. 8, 1970, 45-30294; Apr. 8, 1970, 45-30295; Apr. 8, 1970, 45-34189; Apr. 8, 1970, 45-34191; Aug. 24, 1970, 45-84518; Aug. 24, 1970, 45-84519; Aug. 24, 1970, 45-84521; Aug. 24, 1970, 45-84523; Sept. 18, 1970, 45-93362; Oct. 19, 1970, 45-104352; Nov. 30, 1970, 45-120034; Nov. 30, 1970, 45-120036; Nov. 30, 1970, 45-120054; Dec. 2, 1970, 45-120723; Dec. 2, 1970, 45-120724

Int. Cl. B65h *75/28;* **G11b** *23/10*

U.S. Cl. 242—71.8 **13 Claims**

1. In a tape reel for taking up a ribbon-like recording medium and a leader strip which is greater in width than the recording medium and connected to one end thereof, which said tape reel comprises a hub and two relatively inflexible flanges secured to said hub in axial, spaced-apart relation, the spacing of said flanges being at least equal to the width of said recording medium but less than the width of said leader strip, and which said flanges are provided with outer peripheral portions around which said leader strip may be wound, the improvement wherein at least one of said flanges is provided with a plurality of spaced, radially outwardly extending fingers yieldably engageable with an edge of said leader strip, said



fingers having axially inwardly extending offset portions adjacent their respective outer ends and being characterized by sufficient resiliency to permit such offset portions to retract axially outwardly when an edge of said leader strip is moved therepast when being wound on or unwound from said outer peripheral portions.

3,856,229

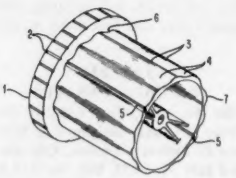
WEB WINDING SPOOL

James Warren Byram, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 6, 1973, Ser. No. 422,238

Int. Cl. B65h *75/18*

U.S. Cl. 242—71.8 **5 Claims**



1. Web winding spool apparatus, comprising:

an axially tapered, generally cylindrical spool body;

means on said spool body for holding an end of a web material to be wound in contact with said spool body;

a flange means at the larger end of said tapered spool body for abutting an edge of said web material to maintain a straight edged formation of a roll of said web material during winding.

3,856,230

WIRE DISPENSING CART

Edward J. Zimmer, 5383 Claridge Ln., West Bloomfield, Mich. 48033

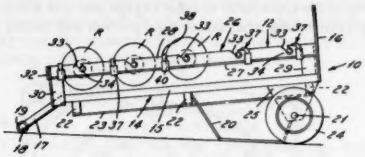
Filed Dec. 13, 1973, Ser. No. 424,292

Int. Cl. B65h *75/40*

U.S. Cl. 242—86.5 R **12 Claims**

1. A cart for dispensing wire or the like products, comprising the combination of a wheeled dolly unit usable as such for transporting loads, and a rigid superstructure unit fixedly mounted on said dolly unit to convert the latter for the dispensing of such products, said superstructure unit comprising a pair of elongated laterally spaced side frame members having a plurality of transversely spaced and aligned pairs of openings to removably receive spindles of end-flanged product reels, and a plurality of like elongated strap devices extending between said laterally spaced side frame members, each of said strap devices being provided at opposite ends

thereof with means for releasably anchoring the strap device to said frame members, with said strap devices in frictional

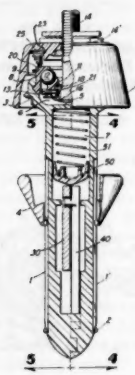


restraining engagement with either a reel and flange or with a spindle for a reel.

3,856,231
BOBBIN HOLDER

Richard K. Whitehead, Sr., 2034 Deborah Dr., N.E.; Richard K. Whitehead, Jr., 2044 Breckenridge Dr., N.E., both of Atlanta, Ga. 30345, and Alvin C. Whitehead, 1890 Silverstone Dr., Decatur, Ga. 30033

Filed Nov. 8, 1973, Ser. No. 414,130
Int. Cl. B65h *49/02*; **D03j** *5/08*
U.S. Cl. 242—130.2 **12 Claims**



1. A bobbin holder for rotatably fastening yarn bobbins to a bobbin creel and comprising:

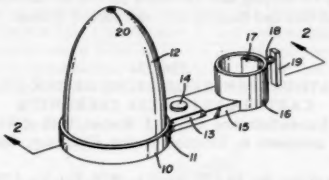
a. a rotatable assembly including a shell insertable into a recess in a bobbin to be held, bobbin catch means supported by said shell, and catch actuating means for extending and retracting at least a portion of said catch means to and from the exterior of said shell to catch and release a bobbin positioned about said shell; and

b. a stationary assembly including a brake shoe, first spring means biasing said brake shoe against said rotatable assembly, frictional engagement means disposed adjacent said rotatable assembly, and second spring means biasing said frictional engagement means into contact with said rotatable assembly in response to the weight of a bobbin held on said rotatable assembly exceeding a preselected magnitude and biasing said frictional engagement means out of engagement with said rotatable assembly in response to the weight of a bobbin held on said rotatable assembly failing to exceed said preselected magnitude.

3,856,232
BUTCHERS TWINE DISPENSER

Ronald M. Rinaldi, 116 S. Cleveland St., Niles, Ohio 44446

Filed Aug. 3, 1973, Ser. No. 385,567
Int. Cl. B65h *49/36*
U.S. Cl. 242—146 **2 Claims**

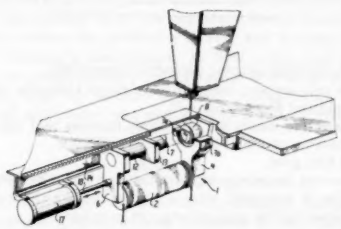


1. A butcher's twine dispenser comprising a base, a cover member frictionally engaged thereon and apertured for guiding twine therethrough, an extension on said base and a clamping device having an arm thereon, said extension movably secured to said arm said clamping device consisting of a circular body member, a V-shaped clamping member disposed therein longitudinally, a threaded shaft loosely engaged on said V-shaped clamping member and engaged in a threaded opening in said circular body member.

3,856,233
THREAD TENSIONING DEVICE

Charles C. Thomas, Starkville, Miss., assignor to Mississippi State University Development Foundation, Inc., State College, Miss.

Filed Feb. 12, 1973, Ser. No. 332,034
Int. Cl. B65h *59/04*, *59/22*
U.S. Cl. 242—156 **16 Claims**



1. A thread tensioning system for a sewing machine comprising means for tensioning the bobbin thread including:

a. a ferromagnetic bobbin, onto which said thread is wound;

b. a ferromagnetic bobbin case for housing said bobbin, said bobbin case being rigidly and removably mounted to a support member;

c. an electromagnetic to provide a source of magnetic flux;

d. radial flux guiding means rigidly connected to an end of said electromagnet for guiding magnetic flux radially between said bobbin and said bobbin case and said electromagnet;

e. axial flux guiding means rigidly connected to the other end of said electromagnet for guiding magnetic flux axially between said electromagnet and said bobbin and said bobbin case, wherein said radial flux guiding means, said axial flux guiding means, said bobbin, said bobbin case and said electromagnet form a closed magnetic circuit;

means for supplying electrical current to said electromagnet to create said magnetic flux therein proportionately to the

magnitude of said electrical current, thereby causing tension on the thread to be created by the combination of the magnetic drag resisting rotation of said bobbin in said magnetic flux and the frictional engagement between said bobbin and said bobbin case caused by said bobbin being urged against an interior wall of said bobbin case by said magnetic flux; and

means for varying said electrical current to vary said magnetic flux and thereby vary said thread tension.

3,856,234

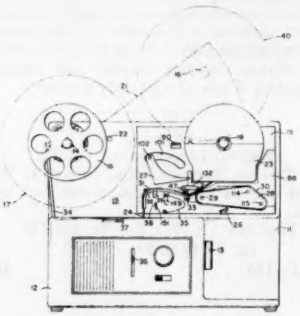
CINEMATOGRAPHIC PROJECTORS OR THE LIKE AND CARTRIDGES FOR USE THEREWITH

John J. Bundschuh, and Robert J. Roman, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 24,657, April 1, 1970, Pat. No. 3,750,976, which is a division of Ser. No. 685,616, Nov. 24, 1967, Pat. No. 3,552,683. This application Apr. 25, 1973, Ser. No. 354,607

Int. Cl. G03b *1/04, 23/04*

U.S. Cl. 242—189 **6 Claims**



1. A cinematographic projector comprising:

a. a roll support member adapted to rotatably support a received film supply roll;

b. movable means for selectively locating said roll support member at either of two fixed positions;

c. a film gate;

d. means for advancing film through said film gate as said film is unwound from a supply roll which is rotatably supported by said roll support member;

e. rewind means operable to rewind said film onto a supply roll supported by said roll support member after said film has been advanced through said gate;

f. rewind actuating means for initiating the operation of said rewind means in response to the occurrence of a predetermined tension in said film between said gate and said supply roll during such advancement of said film; and

g. means for automatically disabling said rewind actuation means whenever said roll support member is located at a predetermined one of said two fixed positions.

3,856,235

MAGNETIC TAPE CONTROL ARM

Robert S. Wallace, 2881 S. Robertson Blvd., Los Angeles, Calif. 90034

Filed Mar. 12, 1973, Ser. No. 340,120

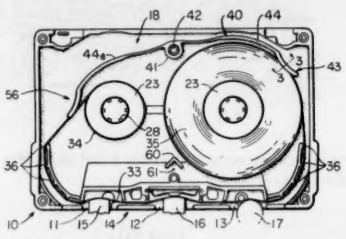
Int. Cl. G11b *23/10*

U.S. Cl. 242—199 **9 Claims**

1. For use in a magnetic tape cassette assembly having cover and receptacle elements defining a case with apertures along an edge thereof for exposing tape to contact with playback unit head means, and tape reel means mounted to rotate within the case, the improvement comprising

a. an elongated cantilevered arm having a first portion to be supported in the case and having a second portion spaced from said first portion to engage and bias the tape,

b. said second portion defining a tape receiving channel, and said second portion having elongated ribbing projecting in the channel to slidably engage and seat a non-track portion of the tape, said second portion also having transversely spaced and opposed surfaces which taper toward the interior of the channel to seat opposite edges of the tape at a tape position of proximal medial engagement with said ribbing, crosswise of the type width, the overall width of said ribbing being substantially less than the spacing between said surfaces, said ribbing confined to the medial portion of said space between said surfaces, said ribbing and surfaces being integral.



3,856,236

COMPOSITE AIRCRAFT

Donald B. Doolittle, Hockessin, Del., assignor to All American Industries, Inc., Wilmington, Del.

Filed May 7, 1973, Ser. No. 357,636

Int. Cl. B64c *37/02*

U.S. Cl. 244—2 **15 Claims**

1. A composite aircraft comprising a large balloon chamber containing a lighter-than-air gas which provides a large static lifting force having a magnitude substantially greater than the weight of said aircraft, said aircraft having a substantially vertical axis, a set of substantially horizontally disposed wings extending radially relative to said vertical axis, a structural assembly connected to said aircraft at said vertical axis for supporting said wings in a substantially horizontal radial array relative to said aircraft, rotatable coupling means connecting said wings to said structural assembly and permitting adjust-

ment of the effective angle of attack of said wings, thrust means mounted upon said wings whereby said wings and chamber are rotated about said axis, and control means connected to said wings for varying their effective angle of attack to either provide a dynamic lifting force for augmenting said static lifting force whereby said combined static and dynamic lifting forces are sufficient to lift large weights or to provide a strong negative dynamic lift for overcoming said static lift and moving said aircraft towards the ground.

3,856,237

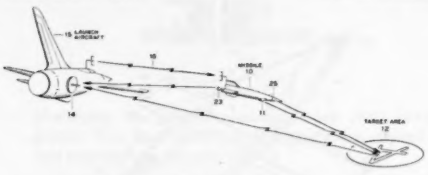
GUIDANCE SYSTEM

John T. Torian, Jackson Heights, and Richard W. Safford, Huntington, both of N.Y., assignors to Fairchild Hiller Corporation, Hagerstown, Md.

Continuation of Ser. No. 402,377, Oct. 6, 1964, abandoned. This application Aug. 3, 1967, Ser. No. 661,164

Int. Cl. F41g 7/00; G01s 9/02

U.S. Cl. 244—3.11 **8 Claims**



1. Apparatus for producing a map of a target area at a first station as observed from a second station, comprising transmitter means at one of said stations for transmitting radiant energy toward a target area, receiver means at the other of said stations for receiving radiant energy directly from said transmitter means and the radiant energy reflected from said target area, said transmitter and receiver means each including an antenna having a radiation pattern, means for scanning one of said radiation patterns over said target area, display means including a screen located at said first station and responsive to said receiver for displaying a map of the area scanned by said one pattern, said display means including means for moving a visual indication across said screen at a preselected rate, means responsive to the time interval between the direct and reflected radiant energy arriving at the receiving means for varying the intensity of said visual indication thereby indicating the range of said target area relative to said second station, and means for synchronizing the movement of said one radiation pattern and the movement of said visual indication whereby the location of said visual indication on said screen is representative of the bearing of said second station with respect to said target area.

3,856,238

AIRCRAFT TRANSPORTER

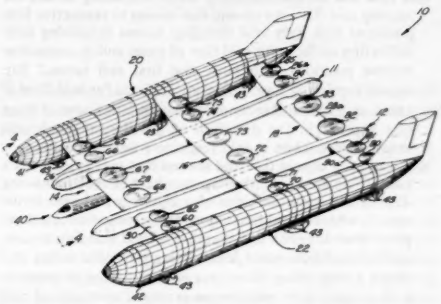
Frank S. Malvestuto, Jr., 4295 E. Mexico Ave., Denver, Colo. 80222

Filed Apr. 14, 1972, Ser. No. 244,068

Int. Cl. B64b 1/20, 1/34

U.S. Cl. 244—5 **26 Claims**

1. An aircraft comprising a wing structure, said wing structure comprising at least one wing having a leading edge and a trailing edge, said one wing having upper and lower surfaces defining an airfoil portion for producing a lifting force when said wing is moved forwardly through the air, at least a portion of the trailing edge of said airfoil portion being configured to define an arcuate recess having a forward portion and a pair of rearwardly extending side portions, a power-driven rotor connected with said one wing and mounted for rotation about a forwardly canted axis which extends at an acute angle to a horizontal plane and is disposed in a vertical plane extending parallel to the direction of forward movement of said one wing, said rotor having generally radial blades with tip portions which are movable along an annular path which slopes upwardly and rearwardly from said trailing edge of said one wing and is at least partially disposed within said arcuate recess, said annular path having a leading portion which is disposed closely adjacent to said forward portion of said recess, said leading portion of said annular path being disposed above said lower surface of said airfoil portion and below said upper surface of said airfoil portion, said annular path having a pair of spaced apart side portions which are disposed closely adjacent to said rearwardly extending side portions of said recess, each of said side portions of said annular path being disposed above said lower surface of said airfoil portion and below said upper surface of said airfoil portion, said annular path having an arcuate trailing portion which is disposed



diametrically opposite and above said leading portion of said annular path, said annular path having a first diametral axis extending forwardly and downwardly at an acute angle to a horizontal plane and intersecting said leading and trailing portions of said annular path, said first diametral axis being disposed in a vertical plane extending parallel to the path of movement of the aircraft, said annular path having a second diametral axis which extends perpendicular to said first diametral axis and parallel to the horizontal plane, said blades having surface means for producing upward and forward thrust and for inducing a low pressure air flow across said upper surface and a high pressure air flow under said lower surface to thereby urge said aircraft upwardly and forwardly upon rotation of said blades, and means for rotating said blades.

3,856,239

APPARATUS FOR THRUST REVERSAL

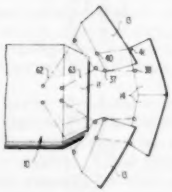
Heinrich Leibach, Grafrath-Wildenroth, Germany, assignor to Motoren-und Turbinen-Union Munchen GmbH, Munich, Germany

Filed Aug. 27, 1973, Ser. No. 391,842

Claims priority, application Germany, Aug. 25, 1972, 2241817

Int. Cl. B64c 15/06

U.S. Cl. 244—12 D **38 Claims**



1. Thrust reversing apparatus for a vehicle having a turbojet engine equipped with a thrust nozzle; said apparatus comprising:

first thrust reversing flap means,

second thrust reversing flap means,

first flap adjusting means for moving said first flap means between inoperative positions out of deflecting engagement with the flow of gases through said thrust nozzle and operative positions with flow deflecting surfaces of said first flap means in deflecting engagement with at least a portion of said flow of gases,

and second flap adjusting means for moving said second flap means between inoperative positions out of deflecting engagement with said flow of gases and operative positions with flow deflecting surfaces of said second flap means in deflecting engagement with at least a portion of said flow of gases,

said first and second adjusting means including means for moving said first and second flap means to respective first positions with only said first flap means furnishing flow deflecting surfaces for said flow of gases and to respective second positions with both said first and second flap means furnishing flow deflecting surfaces for said flow of gases, said first and second flap means being spaced from one another in the direction of gas flow through said thrust nozzle when in said respective second positions,

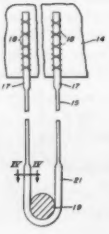
wherein each of said first and second flap means includes a pair of flap members, the flap members of each pair being disposed at opposite sides of a centerline of said thrust nozzle, wherein said first adjusting means includes a main pivot lever for each flap member of said first flap means, each of said main pivot levers being pivotable at one end about a respective pivot axes which is fixed in position with respect to jet pipe means arranged upstream of said thrust nozzle, the respective other ends of each of said main pivot levers being pivotally connected to respective flap members of said first flap means, wherein a pull-push rod is provided between each flap member of said first flap means and a respective guide path extending eccentrically with respect to the fixed pivot axis of the associated main pivot lever, each of said pull-push rods having one end pivotally attached at the respective flap member by way of a pivotal connection spaced from the pivotal connection between said associated main pivot lever and respective flap member and the other opposite end slideably guided in the respective guide path such that pivotal movement of said main levers along a circular arc about the respective fixed pivot axes effects a flatly curved path of movement of said flap members of said first flap means between operative and inoperative positions thereof.

3,856,240

PARACHUTE SUSPENSION LINES

John Conrad Forbis, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 19, 1972, Ser. No. 316,446
Int. Cl. B64d *17/24*
U.S. Cl. 244—142 **9 Claims**



1. A suspension line for use in parachute apparatus to interconnect a payload with a canopy, the combination comprising:

braided filament rope having a preselected line strength,

additional filament material braided into the rope along preselected lengths at the points of attachment to the canopy and to the payload for increasing the load transfer strength at such points, the length of rope receiving said additional filament material being small in relation to the overall length of the rope so that the efficiency for load transfer at the point of attachment at least equals the basic strength of the rope, and

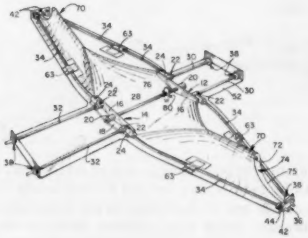
means for attaching the rope having said additional filament material to the canopy.

3,856,241

KNOCKDOWN KITE

Sam Kupperman, and Dennis I. Kupperman, both of Skokie, Ill., assignors to R. B. Toy Development Co., Skokie, Ill.

Filed June 14, 1973, Ser. No. 369,890
Int. Cl. B64c *31/06*
U.S. Cl. 244—154 **10 Claims**



1. A knockdown kite comprising a framework which forms a wing framework, a forward and rearward framework extending forwardly and rearwardly respectively of said wing framework, said framework comprising a front connector and a rear connector, said front connector having spaced forwardly facing sockets and laterally facing sockets, said rear connector having spaced rearwardly facing sockets and laterally facing sockets, a rod connecting said front and rear connectors in spaced relation, a pair of spaced rods secured in said forward facing sockets and forming the forward framework and a pair of spaced rods secured in said rearward facing sockets and forming the rearward framework and laterally extending rods secured in said laterally facing sockets and forming the oppositely extending wings of said wing framework, said rods and connectors being detachably secured and when secured forming the framework of said kite, a covering secured to the free ends of said rods, said covering being of a flexible material and having a width between the laterally extending rods so that the wing coverings billow upwardly and form pockets in the underside of said wing coverings while the kite is in flight.

3,856,242

MOUNTING APPARATUS FOR A SURGE VOLTAGE ARRESTER

Bernard D. Cook, Pittsfield, Mass., assignor to General Electric Company

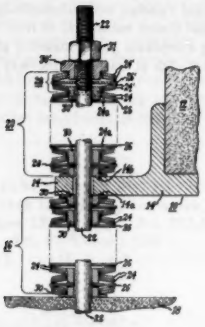
Filed Mar. 29, 1973, Ser. No. 346,130
Int. Cl. F16f *15/00*
U.S. Cl. 248—20 **2 Claims**

1. In combination with a surge voltage arrester having a generally elongated ceramic housing and an attached supporting foot, a shock and energy absorbing apparatus comprising:

a. a resilient member for flexibly connecting the supporting foot and a mounting body, the resilient member having the capability of changing dimensions and absorbing energy under influence of shock energy; and

b. means including a bendable metal plate for providing a limiting connection between the supporting foot and the

mounting body when shock energy less than a predetermined magnitude is applied to said combination and for



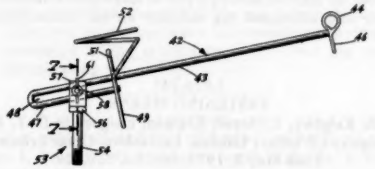
eliminating the limiting connection when shock energy greater than the predetermined magnitude is applied to said combination.

3,856,243

HOLDER

Lewis L. Ruter, 2111 3rd St., North, Minneapolis, Minn. 55411

Division of Ser. No. 15,368, March 2, 1970, Pat. No. 3,640,494. This application Feb. 8, 1972, Ser. No. 224,508
Int. Cl. A01k 97/10
U.S. Cl. 248—42 **16 Claims**



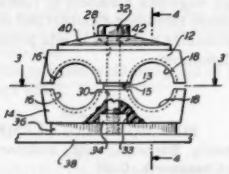
1. A holder for attaching an object to a boat having at least one oarlock with a generally upright hole comprising: an elongated arm having an end portion with an elongated slot, a mount at said end portion of the arm positionable at an angle with the arm, said mount having a cylindrical member adapted to fit into the hole of the oarlock and a head larger than the hole of the oarlock on one end of the cylndrical member providing a stop to locate the cylindrical member in the hole in the oarlock, and projection means secured to and extended from the head, and connector means having a portion located in the slot coupling the arm to the projection means, said connector means having cooperating members adjustable relative to each other to hold the arm at a selected angle relative to the mount and at a selected longitudinal position on said mount, said cooperating member being releasable whereby the arm can be angularly and linearly movable relative to the projection means, and a stop member secured to the arm and projected generally in the direction of the mount, said stop member being adjustable with the arm relative to the mount whereby the stop member can be located in engagement with an outside portion of a boat adjacent the oarlock to limit pivotal movement of the arm relative to the boat.

3,856,244

CLAMPING APPARATUS

Arnold Menshen, Beuler-Weg 52, Neuenrade Westf., Germany

Filed July 26, 1972, Ser. No. 275,338
Int. Cl. 248 68 CB; F16l 3/02
U.S. Cl. 248—54 R **3 Claims**



1. Clamping apparatus for clamping a plurality of longitudinally extending members in a predetermined spaced apart relationship, comprising:

a pair of clamping members, each of said clamping members provided with at least two groups of inwardly directed parallel, arcuate, ridge-like members, and a centrally positioned spacer means, and upon the assembly of said clamping members in a predetermined opposed relationship, said groups of ridge-like members formed in each clamping member being placed opposite the groups of ridge-like members formed in the other clamping member with said spacer means engaging each other whereby said groups of ridge-like members cooperatively provide two partially closed, longitudinally extending interrupted apertures having parallel longitudinal axes, said apertures for receiving said longitudinally extending members and said ridge-like members for engaging said longitudinally extending members;

said clamping members, including said ridge-like members, being of a predetermined resilient material for dampening vibrations and shocks and for absorbing noise;

each of said clamping members having an aperture formed centrally thereof, in a direction perpendicular to the said longitudinal axes of said longitudinally extending apertures, and upon said assembly of said clamping members, said apertures being aligned and receiving a threaded fastener;

at least one of said clamping members having a counterbore formed centrally thereof coincident with said aperture formed centrally thereof, said counter-bore being formed in said one clamping member generally opposite said two groups of ridge-like members formed therein;

a metal welding plate having a boss formed centrally on one surface thereof and having a threaded aperture formed centrally thereof and through said boss, said welding plate permitting the welding of said clamping apparatus to a metal support surface;

said metal welding plate for engaging said clamping member having said counter-bore formed centrally thereof and having its boss received within said counter-bore and having its threaded aperture aligned with said aperture formed centrally of said clamping member;

a threaded fastener having a bolt head formed on one end thereof and the other end thereof having threads formed thereon;

a clamping plate having an aperture formed centrally thereof for receiving said threaded fastener, said clamping plate being of a material more rigid than said predetermined resilient material of said clamping members, said clamping plate engaging the other of said clamping members and having its aperture aligned with said aperture formed centrally of said other clamping member;

upon said clamping members being assembled as said and said longitudinally extending members being received within said apertures formed by said ridge-like members, and upon said welding plate and cover plate being in

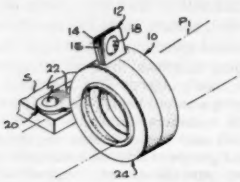
engagement with said clamping members as said, said threaded fastener being received within said centrally formed apertures with said bolt head engaging said cover plate and said threads being placed in threaded engagement with said threads formed in said welding plate whereby said resilient clamping members are compressed together by said clamping plate and said welding plate to cause said ridge-like members to resiliently engage said longitudinally extending members and clamp said longitudinally extending members in said predetermined spaced apart relationship.

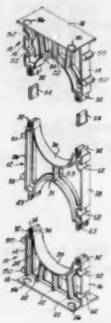
3,856,245

PIPE MOUNTING CLAMP

Robert M. Byerly, Burbank, Calif., assignor to Viking Industries, Inc., Chatsworth, Calif.

Filed Mar. 14, 1973, Ser. No. 341,276
Int. Cl. F16l *3/12*
U.S. Cl. 248—54 R **3 Claims**





1. A pipe mounting clamp comprising:

a band for encircling a pipe, said band having a pair of tab portions fastenable to each other to tighten the band on the pipe; and

a cushion of resilient material covering the radially inner surface of the band to contact and encircle the pipe, said cushion having a pair of radially-inwardly extending end ridges at the axially opposite ends of the cushion and having a middle ridge located between said end ridges, each of said end ridges having a height which is at least 50 percent greater than the height of said middle ridge, whereby the middle ridge does not contact a pipe until the end ridges have been severely deformed.

3,856,246

CONDUIT SPACER MODULAR CONSTRUCTION

George M. Sinko, Royal Oak, Mich., assignor to Underground Products, Inc., Livonia, Mich.

Filed May 19, 1972, Ser. No. 255,225
Int. Cl. F16l *3/22*
U.S. Cl. 248—68 CB **8 Claims**

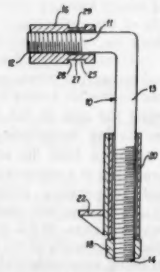
1. A conduit spacer assembly comprising a pair of end frame members each of generally rectangular configuration having a straight side and a side which is recessed inwardly for accepting part of the periphery of a conduit disposed with its axis in a substantially perpendicular relationship to the plane of said frame member, an intermediary substantially similar frame member having two opposite sides recessed inwardly and normally disposed in an adjacent position to the recessed side of each of said frame members such as to surround the remaining of the periphery of the conduit, and locking means on each extremity of said recessed sides comprising an elongated prong member on one of said frame members having a longitudinal axis and engageably projecting within a bifurcated lug member integrally projecting from another of said frame members, said bifurcated lug member formed by a pair of identical flexibly spreadable sidewall members for accepting said prong member, and at least one one-way wedging and locking step formed on a surface of said prong member for interlockingly engaging a corresponding wedging and locking recess on an interior surface of one of said sidewall members of said bifurcated lug member for preventing separation of said frame members in a direction substantially perpendicular to the axis of said conduit and substantially parallel to the plane of said frame members while permitting sliding separation of said frame members in a direction substantially parallel to the axis of said conduit and substantially perpendicular to the plane of said frame members, at least one of said prong members being a separate prong member provided on at least a surface thereof with at least one one-way wedging and locking step for interlockingly engaging said corresponding wedging and locking recess on an interior surface of one of said sidewall members of said bifurcated lug member and on at least another surface thereof with at least a second one-way wedging and locking step for interlockingly engaging the corresponding wedging and locking recess on an interior surface of one of said sidewall members of said bifurcated lug member for interconnecting a pair of said frame members and having said bifurcated lug member on the interconnected sides.

3,856,247

FASTENING MEANS

Neville Keighley, Clitheroe, England, assignor to D. T. & N. Keighley (Whalley) Limited, Lancashire, Great Britain

Filed May 2, 1973, Ser. No. 356,520
Claims priority, application Great Britain, May 3, 1972, 20507/72
Int. Cl. B61d *45/00*; B65j *1/22*; B60p *3/32*
U.S. Cl. 248—154 **7 Claims**



1. A fastener for removably fastening a shipping container to the top side of a vehicle platform, comprising: a body mem-

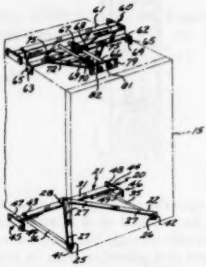
ber of L-shape and having a short horizontal leg, a long vertical leg and also having screw threads at the ends of the legs; a spigot defining a peripheral recess rotatable on the thread of the short leg, so that the location of the recess can be adjusted lengthwise of the short leg; a sleeve member movable along the long leg and having an abutment bracket extending therefrom in the same direction as that of the short leg, said bracket defining a surface to engage the underside of the vehicle platform; and nut means engaging the screw thread of the long leg and acting on the lower end of the sleeve member, to move the sleeve member along the long leg and hence adjust the location of the bracket lengthwise of the long leg.

3,856,248

APPLIANCE LEVELING DEVICE

Donald J. Labelle, 3148 Tevis Ave., Long Beach, Calif. 90808

Filed June 25, 1973, Ser. No. 373,197
Int. Cl. F16m *11/24*
U.S. Cl. 248—188.2 **8 Claims**



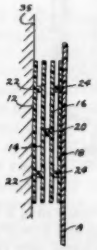
1. Apparatus for aligning the angular orientation of an appliance relative adjacent supporting structure, comprising:
first support means attached to said structure for pivotally supporting the bottom surface of said appliance; and
second support means attached to said structure in substantially parallel alignment with the top surface thereof and connected to said appliance for providing adjustment in translation of the relative position of the top surface thereof along two orthogonal axes.

3,856,249

SELF-SECURING HOLDING DEVICE

Bruce J. Frye, 13601 69th Ave. North, R.R. No. 2, Osseo, Minn. 55369

Filed Mar. 15, 1973, Ser. No. 341,720
Int. Cl. F16m *13/00*
U.S. Cl. 248—205 A **3 Claims**



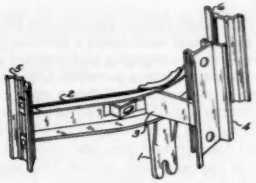
1. A self-securing article holding device having in combination
a body portion comprising a plurality of layers,
welds securing together adjacent of said layers,
said welds being spaced inwardly of the edge portions of said layers,
one of the outward facing surfaces of the layers at each end of said body portion comprising a self-securing surface,
a pair of said welds securing together the facing surfaces of an adjacent pair of said layers,
a weld securing together the outer facing surface of one layer of said pair of layers and the facing surface of a layer adjacent thereto, and
said pair of welds and said weld being out of registry with respect to each other.

3,856,250

INTERENGAGED COMPONENT ELECTRICAL EQUIPMENT MOUNT

Marion R. Farmer, Memphis, Tenn., assignor to Aluma-Form, Inc., Memphis, Tenn.

Continuation of Ser. No. 96,481, Dec. 9, 1970, abandoned.
This application Oct. 24, 1972, Ser. No. 300,163
Int. Cl. F16m *13/02*
U.S. Cl. 248—221 **15 Claims**

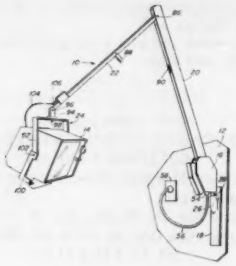


1. An improved electrical equipment mount for attachment to a utility pole and formed from components that interengage to provide enhanced structural support comprising an elongated bearing plate adapted for bearing against said pole, means holding said bearing plate securely to the pole, a horizontally disposed channel member arranged for engagement at approximately its midpoint to said bearing plate, means provided upon said bearing plate for stabilizing said channel member in a horizontal position, brace means connecting at one end to said channel member and fixed against vertical movement by means of said member, a vertically disposed bracket connecting to and interlocking with the opposite end of said brace means, a pair of additional brackets, one of each bracket connecting to and interlocking with the laterally disposed end of said channel member, each additional bracket being formed having a vertically disposed plate, means associated with said plate to accommodate attachment of electrical devices to said bracket, a pair of flanges integrally connecting to and extending from the surface of said plate to embrace the contiguous end of the channel member to stabilize the mounting of said bracket, connecting means engaging both said plate and said proximate channel member to secure the same together, each connecting means comprising at least one angle means, each of said angle means formed having a pair of integrally attaching legs, said channel member formed having grooves provided upon its upper or lower surfaces, one leg of each angle means interlocking within a channel member groove to stabilize the bracket against movement, said angle means arranged through an aperture provided through said plate, said plate having a longitudinally disposed groove formed in its side opposite to the side of the plate that engages the channel member end, the other leg of said angle means interjoining within said plate groove to further stabilize the bracket, and fastener means securing said angle means to the respective plate and channel member to hold the same together.

3,856,251
SELF-COMPENSATING EXTENSIBLE BEAM

Julius Miller, Brockton, Mass., assignor to Nouveau Products Corporation, Brockton, Mass.

Filed Oct. 24, 1972, Ser. No. 299,710
Int. Cl. A47f 5/00; F21s 1/02
U.S. Cl. 248—280 **8 Claims**



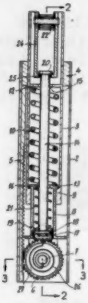
1. A self-compensating, extensible beam, comprising
a. a base,
b. a fully rigid single tubular primary arm pivotally mounted at one end to said base about a first horizontal axis,
c. first spring means engaging said primary arm at said one end and urging it into a normally raised position,
d. said first spring means including a rigid rocker arm fixed perpendicularly to the one end of said primary arm and intersecting said first axis, a pair of parallel guideways mounted fixed to said base and oriented along lines extended to opposite sides of said first axis, a coil spring mounted in each of said guideways, a connecting rod connected to each end of said rocker arm, each of said connecting rods extending through said guideways in co-axial engagement with one of said coil springs,
e. a fully rigid single secondary arm levered near one end directly to the other end of said primary arm about a second horizontal axis parallel to said first axis,
f. load-supporting means mounted to the free other end of said secondary arm, and,
g. second spring means extending longitudinally within said primary arm and connected to said one end of said secondary arm and to said base at a point spaced from said first axis of said primary arm for normally urging upwardly said other end of said secondary arm, said point being offset from a line between said first and second axes, whereby the force on said second spring means will increase upon at least one of said arms being pivoted downwardly,
h. said second spring means including a coil spring, a connecting rod engaging the lower end of said spring and said one end of said secondary arm, and a shipping rod engaging the upper end of said spring and said base at said point whereby said spring is compressed between said rods.

3,856,252
TELESCOPIC SUPPORT FOR SEATS, TABLES AND THE LIKE

Rene Marc Jean Regis, Fontaines Saint Martin, France, assignor to Les Aplications Industrielles du Tube, Villeurbanne (Rhone), France

Filed Nov. 23, 1973, Ser. No. 418,771
Claims priority, application France, Nov. 29, 1972, 72.43276
Int. Cl. A45d 19/04; F16m 13/00
U.S. Cl. 248—402 **4 Claims**

1. Telescopic support for members such as seats, tables and the like, of the type comprising a fixed outer tube, for attaching support legs, an inner tube sliding axially inside the outer tube attaching the member for which this support is intended, a rack integral with one of the tubes along one of its generatrices, a toothed wheel mounted to rotate freely on a shaft supported transversely by the other tube, in order to mesh with the aforesaid rack and a toothed shoe capable of engaging in the teeth of the aforesaid toothed wheel in order to prevent it from rotating and with which are associated operating means making it possible to disengage it from these teeth, characterised in that the rack is integral with the outer tube and the shaft of the toothed wheel is supported by a lower sliding extension of the inner tube, spring means normally keeping the inner tube and its extension in the extended position,

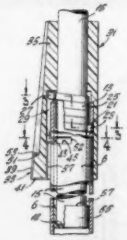


whereas means for operating the toothed shoe are constituted by a rod to which the toothed shoe is attached at the lower end, which passes axially through the inner tube and its extension and whose upper end, provided with an enlarged head, is slidably connected by means of a stirrup member to a control lever pivoted at a pivot integral with the inner tube upward movement of the control lever causing the displacement in the same direction of the aforesaid rod, when the member supported by this support is not under load, but having no action on this rod when, owing to the loading of this member, the inner tube has slid downwards on its lower extension and on the rod.

3,856,253
ADJUSTABLE STAND

Frederick L. Seebinger, Smoke Rise, N.J., assignor to American Trading and Production Corporation, Baltimore, Md.

Filed May 1, 1973, Ser. No. 356,225
Int. Cl. F16b 7/14
U.S. Cl. 248—411 **10 Claims**



1. An adjustable stand comprising a base, a first rigid tube having an end connected to said base and an opposed free end upstanding therefrom, a second right tube of lesser diameter than said first rigid tube and slidably connected therewith, said second rigid tube being telescopable within said first rigid tube, resilient means between said first and second rigid tubes for releasably biasing said second rigid tube in a normally

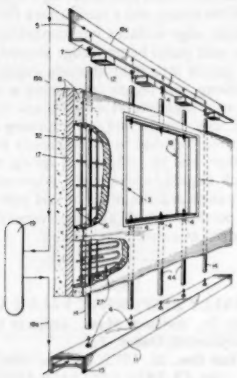
fixed position relative to said first rigid tube, and clutch means for releasing said resilient means for vertically adjusting said second rigid tube relative to said first rigid tube, said clutch means being discrete from said resilient means for normally maintaining said first and second rigid tubes in assembled relation and comprising an assembly clip including a pair of leg members connected one to the other by a base member, one of said legs terminating in a U-shaped body extending initially outwardly from the plane of said leg and returning inwardly toward the plane of said leg, said first rigid tube being provided with a lateral slot for receiving said U-shaped body, said U-shaped body being rotatable through said lateral slot for releasing tension of said resilient means on said second rigid tube whereby said second rigid tube may be vertically adjusted relative to said first rigid tube.

3,856,254

FORM FOR WALL PANELS WITH IMBEDDED HEATING TUBES

Arthur P. Fattor, 5380 S. Holly St., Englewood, Colo. 80110

Filed Nov. 17, 1972, Ser. No. 307,371
Int. Cl. E04g *15/02*
U.S. Cl. 249—39 **4 Claims**



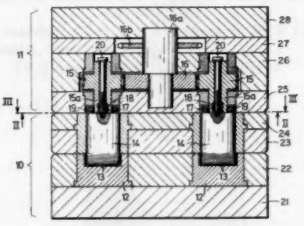
1. Apparatus for the production of precast composite concrete wall units comprised of upper and lower mold elements, side walls and members arranged to form an enclosure in the nature of a mold cavity; said upper and lower mold elements include plates; a plurality of conically shaped, tubular members positioned on said upper and lower plates and extending vertically into said mold cavity; a plurality of tubular means mounted in said mold cavity and each mounted on and fitted to an upper and lower conically shaped, tubular member for passage of steam or heated fluid therethrough; means inclusive of a source of steam or hot fluid for passing steam or heated fluid through said plurality of tubular means; a steel matrix parallel with said side walls centrally located in said mold cavity and coextensive therewith and affixed to said tubular means; and means including entry ports at the bottom of both end members for introducing fluid concrete under pressure into said mold cavity to exclude air pockets from said cavity.

3,856,255

APPARATUS FOR THE FABRICATION OF INJECTION-OLDED OR DIE-CAST ARTICLES

Wilfried Holzmann, Torkenweiler, Germany, assignor to Firma Hasco Normalien Hasenclever & Co., Ludenscheid, Germany

Filed Aug. 31, 1972, Ser. No. 285,308
Claims priority, application Germany, Sept. 9, 1971, 21450420
Int. Cl. B29f *1/14*
U.S. Cl. 249—59 **5 Claims**



1. An apparatus for the fabrication of ejection-molded or die-cast articles equipped with a thread, such as screw-closing caps, comprising:

a molding unit including

a body,

a plurality of forming sets in said body defining openings for forming articles to be molded therein, and

respective cores rotatable in said body and having threaded portions at one end of each core receivable in said opening and engageable by the article to be molded therein; and

a driving unit including

a housing,

a plurality of driving pinions in said housing alignable with said cores upon juxtaposition of said units, common drive means in said housing for rotating said pinions, and

coupling means for operatively and releasably connecting together said drive pinions and the corresponding cores, said driving unit constituting an independent drive set adapted to be a dismounted from said molding unit and usable independently thereof, said drive pinion and the respective threaded cores being formed with complementarily shaped structural parts, one of said parts including a receiving member and the other of said parts forming a stay flange axially projecting from the other of said structural parts and engaging snugly in said receiving member.

3,856,256

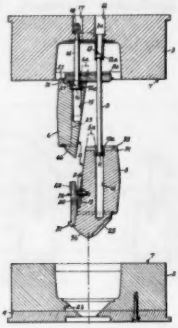
INJECTION MOLD FOR MAKING HOLLOW BODIES HAVING A MOLD LOCKING CORE

Louis Emile Celesti, Sonnaz (Chambery), France, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Mar. 14, 1973, Ser. No. 341,045
Claims priority, application France, Mar. 22, 1972, 72.10742
Int. Cl. B29c *1/14*; B29f *1/14*
U.S. Cl. 249—66 **5 Claims**

1. Apparatus for injection molding of open-ended hollow bodies comprising a mold having a parting plane perpendicular to the axis of symmetry of the mold and passing through the largest section of the mold between the two ends thereof so as to divide the mold into an upper part and a lower part, a core disposed within the mold and separated along a plane slanted with respect to the axis of symmetry thereof and dividing said core into a first part having a large base portion and a second part having a small base portion, and means adapted

to be actuated by the mating of the core parts for locking the core part having the large base portion to the lower mold part, said locking means including a latch pivoted on said first core part, a groove in said second core part having a slanted bottom



portion, and a tail on said latch constructed and arranged for engagement with the bottom portion of said groove for moving said latch to its engaged position when the mold is closed thereby locking said first core part to said lower mold part.

3,856,257

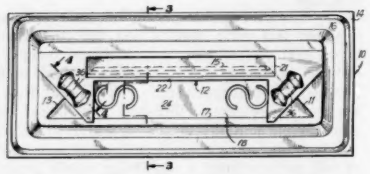
MOLDED PICTURE FRAME

Janet M. Wetstone, 1041 Crane Rd., N.E., Atlanta, Ga. 30324

Continuation-in-part of Ser. No. 142,701, May 12, 1971, abandoned. This application Aug. 6, 1973, Ser. No. 386,026

Int. Cl. B41b *11/54*

U.S. Cl. 249—160 **4 Claims**



1. A combined two-part mold for forming a segment strip for a picture frame and providing for the simultaneous formation, by molding, of the strip and keying means for attaching a segment to an adjacent segment, the combined mold comprising (a) a female mold having a first depression comprising an article space-defining surface for defining a strip, key depressions extending outwardly from the space-defining depression but continuous therewith, and an annular perimetric edge portion surrounding the depressions; and (b) a hermaphroditic mold comprising an annular perimetric edge portion adapted to engage in abutting relationship with at least a portion of the annular perimetric edge portion of the female mold; a front convex s .face extending outwardly from the perimetric annular edge portions and a rear surface having a second and a third depressions comprising article space-defining surfaces for defining two keying means, first portions of the front convex surface fitting within the key depressions in the female mold and second portions extending across and into the first depression in the female mold; the combined mold, thereby, simultaneously permitting, when the annular perimetric edge portions are in abutting relationship and the convex surfaces on the hermaphroditic mold are properly juxtaposed within the key depressions in the female mold, the simultaneous molding of the frame strip, with key depressions formed therewithin, and the keying means.

3,856,258

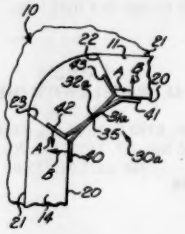
X-SHAPED HOT TOP CORNER WEDGE

George Dowidchuk, Novelty, and James R. Stockham, Lakewood, both of Ohio, assignors to Oglebay Norton Company, Cleveland, Ohio

Filed June 28, 1973, Ser. No. 374,365

Int. Cl. B22d *7/10*

U.S. Cl. 249—197 **7 Claims**



1. Apparatus for use in a hot top including a plurality of preformed elongated refractory panels for location within a casing, at least one of said panels having a front surface facing the interior of the casing and a rear surface for engaging a wall thereof and side edge surfaces interconnecting the front and rear surfaces, said panel being wedge shaped, and means for wedging the panels into tight abutting engagement with the wall of said casing, said means comprising at least one corner wedge made of a sheet metal material and having a tapered configuration, said corner wedge comprising a pair of spring members secured together to be resiliently deflectable away from each other, one of said pair of spring members having portions which engage, respectively, adjacent side edge surfaces of said panels and the other of said pair of spring members having portions which engage, respectively, the front surfaces of adjacent ones of said panels.

3,856,259

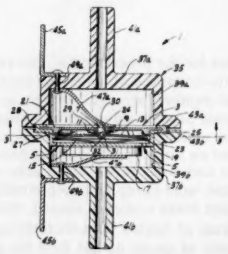
THERMALLY RESPONSIVE VALVE ASSEMBLY

John Doherty, Jr., Assonet, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 20, 1973, Ser. No. 426,768

Int. Cl. F03g *7/06*; **F16k** *31/56*

U.S. Cl. 251—11 **11 Claims**



1. A thermally responsive electrically actuated valve assembly comprising a generally flat cylindrical capsule having an inlet port in one face and an outlet port in the other face thereof with communication between said ports, one of said ports having a valve seat, valve means movable into and out

of engagement with said valve seat thereby selectively to block communication between said ports, said valve means comprising a generally circular dish-shaped snap-acting thermostatic disk responsive to a variation in temperature to abruptly change its curvature between a first position in which said disk is bowed toward said seat and the valve means are closed against said seat thereby to block communication between the ports and a second position in which the disk is bowed away from the seat and the valve means are spaced therefrom thereby to open communication between the ports, spring means biasing said disk and said valve means toward said seat when the disk is in said first position thereby to apply sufficient force thereto to maintain said valve means closed against said seat, an electric heater secured to one face of the capsule in heat exchange relationship with said disk whereby when electrically energized it will heat said disk to a temperature at which said disk will reverse curvature from one position to the other, and abutment means spaced from the disk when it is in its first position and against which the disk reacts to effect movement thereof into its second position.

3,856,260

THREE-WAY SOLENOID VALVES

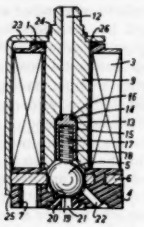
Jean-Louis Giordano, Billancourt, France, assignor to Regie Nationale des Usines Renault, Billancourt and Automobiles Peugeot, Paris, both of, France

Filed Mar. 23, 1973, Ser. No. 344,208

Claims priority, application France, Mar. 31, 1972, 72.11672

Int. Cl. F16k *11/10, 31/06*

U.S. Cl. 251—129 **5 Claims**



1. A ball-type three-way solenoid valve, comprising:

a. an electromagnet comprising

a magnetic yoke,

a magnetic core having a longitudinal axial passage therein, and,

a coil yoke having a solenoid coil wound thereon;

b. a valve member slidably disposed in said magnetic core's passage;

c. a valve seat for said valve member, disposed in said magnetic core's passage;

d. a gasket disposed in engagement with said valve seat;

e. a copper-coated ball movably responsive to the pulling effect of said electromagnet;

f. a seat member for said ball;

g. a compression spring interposed between said valve member and said ball;

h. said coil yoke and said seat member being portions of a unitary synthetic material molded member having a longitudinal axial passage therein, said magnetic core inserted into said molded member's passage proximate said coil yoke portion and said ball inserted into said molded member's passage proximate said seat member portion, a shoulder disposed in said molded member's passage to abut said core and an abuttment disposed in said molded member's passage to support said ball when said electromagnet is de-energized;

i. a pair of seals disposed in said molded member's passage, said first seal disposed at one end of said passage in said seat member portion, and said second seal disposed at the opposite end of said passage between said core and said coil yoke portion; and

j. said magnetic yoke comprising a folded pressed sheet, steel shield partially enclosing said molded member proximate said coil.

3,856,261

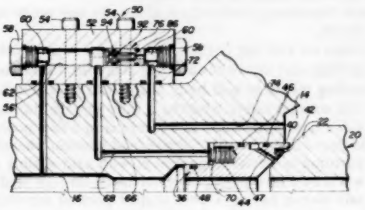
PRESSURE RELIEF MEANS FOR VALVE BODY CHAMBER

Jerry W. Jourdan, Alvin, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Aug. 2, 1973, Ser. No. 385,208

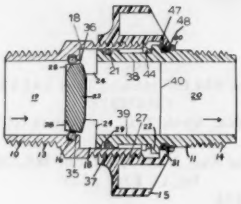
Int. Cl. F16k *25/00*

U.S. Cl. 251—172 **2 Claims**



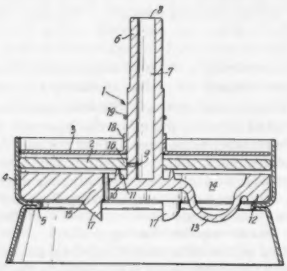
1. A ball structure comprising a valve body and upstream and downstream flowlines, a valve member mounted within the valve body, means to move the valve member between open and closed positions to control the flow of fluid, a fluid pressure actuated sealing member on opposed sides of the valve member providing upstream and downstream sealing members, a separate pilot valve for each sealing member mounted outside the valve body, each pilot valve including a body having a central bore and three ports communicating with the bore and spaced longitudinally of the pilot valve body to provide intermediate and end ports, a first fluid conduit between the intermediate port and associated sealing member to provide fluid rearwardly of the sealing member to urge the sealing member toward the valve member, a second fluid conduit between one end port and the associated flowline, a third fluid conduit between the other end port and the valve body, a shuttle member responsive to fluid pressure from said end ports slidable back and forth within the central bore between positions selectively communicating the intermediate port with one of the end ports and blocking flow to the other end port thereby to provide fluid rearwardly of the sealing member, the shuttle member having a check valve therein which is actuated at a predetermined high fluid pressure in the valve body when the shuttle valve is in a position blocking flow to the second fluid conduit, said shuttle member upon a fluid pressure being reached in the valve body greater than the fluid pressure in the flowline being moved to the position blocking flow to the second fluid conduit, said check valve within the shuttle member being opened at said predetermined high temperature in the valve body to permit a flow of fluid from the valve body to the flowline through the second fluid conduit thereby to reduce any excessive fluid pressure within the valve body.

3,856,262
VALVE
Chalmer C. Jordan, Perry Hwy., Saegertown, Pa. 16433
Filed Nov. 17, 1972, Ser. No. 307,657
Int. Cl. F16k *51/00*
U.S. Cl. 251—340 **9 Claims**



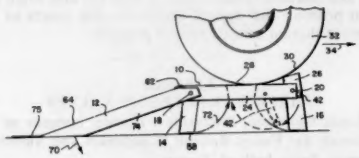
1. A valve comprising a body, a sleeve telescopically received in said body,
said sleeve having a partition supported on one end,
an external flange on said sleeve,
a nut threadably received on said body and receiving said sleeve,
a flange on said nut engaging said flange on said sleeve for moving said sleeve toward and away from said body,
a sealing means in said body adapted to engage said partition on said sleeve whereby a flow passage through said valve is stopped when said sleeve is in a first position,
said sleeve being movable to a second position whereby said partition is out of engagement with said sealing means whereby a flow passage is established through said valve, said sleeve having a oval shaped portion received in a complementary shaped portion in said body whereby said body and said sleeve are held against relative rotation.

3,856,263
VALVES
Richard Terence Macguire-Cooper, 3 Burcot Park, Clifton Hampden, near Abingdon, England
Filed Jan. 7, 1972, Ser. No. 216,215
Claims priority, application Great Britain, Jan. 8, 1971, 1110/71; Mar. 2, 1971, 5767/71; Dec. 14, 1971, 57895/71
Int. Cl. F16k *31/58*
U.S. Cl. 251—347 **4 Claims**



1. A valve assembly comprising a resilient gasket and a plastics moulded member having a valve surface normally contained by said gasket to provide a releasable closed condition of said assembly, said moulded member comprising:
a valving region defining said valve surfaces;
a flexible spokes integral with and extending from said valving region; and
supporting means to which said spokes extend so that said valving region is displaceable relative to said supporting means for displacing said valve surface from said gasket, said supporting means comprising a member having portions defining slots, wherein said spokes extend into said slots, and wherein said slot defining portions support said gasket at zones nearer said valving region than the outer ends of said spokes, said spokes and said slots extending non-radially of said valving region.

3,856,264
PORTABLE WHEEL STAND
Francis L. Thumma, 3714 W. Rose Ln., Phoenix, Ariz. 85019
Filed Aug. 4, 1972, Ser. No. 278,103
Int. Cl. E02c *3/00*
U.S. Cl. 254—88 **8 Claims**



1. In a portable wheel stand, the combination of: an elongated platform member having opposite ends and disposed to be supported in a substantially horizontal position above the surface of the ground; first and second leg members having normally upper portions pivotally connected to said platform member; said leg members movable from a position substantially parallel to said platform member and into a downwardly directed position; said leg members having normally lower ends disposed to engage the ground and to support said platform member in said horizontal position; and an elongated normally inclined ramp member having a normally inclined upper wheel engaging surface; said ramp member having a first end pivotally connected to one of said opposite ends of said platform members; said ramp member having a second end disposed to rest on the ground so as to maintain said ramp member in an inclined position and extending from the ground to substantially the level of said platform member; said ramp member pivotally movable relative to said platform member so as to permit said ramp member and said leg members to be disposed in substantially contiguous parallel relation to said platform member for collapsing said portable wheel stand into compact position; first and second latch members pivotally connected to said platform member; said first and second latch members disposed and adapted respectively to brace and hold said first and second leg members in downwardly directed relation to said platform member and to prevent pivotal movement of said leg members into a nonsupporting position, relative to an elevated position of said platform member.

3,856,265
TENSIONING DEVICE
Howard F. Foster, 1050 N.W. 55th St., Fort Lauderdale, Fla. 33505
Filed July 30, 1973, Ser. No. 383,587
Int. Cl. A63b *61/04*; **B65d** *63/00*
U.S. Cl. 254—161 **3 Claims**

1. In a tensioning device for a flexible element having a bolt with an aperture therein to receive the end of a flexible element to be wound around a bolt and a polygonal portion with adjoining flat surfaces adjacent one end thereof, a stem, and a frame having a base and substantially parallel legs projecting from the base, the legs having openings which are aligned with each other across the space between the legs so that the bolt is rotatable and axially adjustable in a lateral direction in the openings, the bolt having a nut for the end thereof opposite the polygonal portion, the improvement wherein the entire

width of one of said legs at the side of the opening therein is offset laterally outward and substantially parallel to said one leg on the opposite side of said opening and presents only three polygonally disposed, adjoining flat edges which face toward the axis of said opening and are each elongated substantially perpendicular to the axis of said opening and are

each spaced from said axis by substantially a radius of said polygonal portion of the bolt to a flat surface thereon to hold three sides of the polygonal portion of said bolt against rotation when said bolt is axially shifted toward the other of said legs, said one leg having no other edges for engaging said polygonal portion of said bolt.

3,856,266

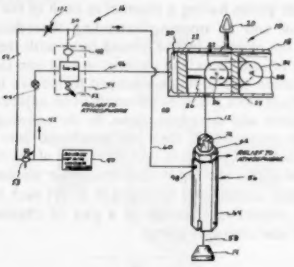
BALANCING APPARATUS WITH SERVO RELIEF VALVE

Lorne J. Kendrick, 5131 Surfwood, Milford, Mich.

Continuation of Ser. No. 13,272, Feb. 24, 1970,. This application Oct. 12, 1971, Ser. No. 188,534

Int. Cl. B66d *1/44*

U.S. Cl. 254—168 **3 Claims**



1. In a pneumatic hoist for raising and lowering a load including a pneumatic device having a fluid power chamber and a piston movably disposed within the power chamber, a hoisting cable connected to the piston to be raised and lowered according to movement of said piston, a source of air under pressure and regulator means for connecting the source to the power chamber to urge movement of the piston in a direction shortening the cable, valve means carried by the cable so as to be raised and lowered with it, said valve means having a fluid port connected to the regulator means and being operable to open said port to change fluid pressure in the power chamber as the valve means is moved from a closed position toward an open position, means connecting the load to the valve means to move said valve means from said closed position toward said open position as the load is manually lowered from a hoisted position, said valve means comprising an elongated housing member, said port formed in said housing member and connected with the outlet of said regulator means, a passage connected with said port and extending through said housing member to one end thereof, said passage being parallel to and spaced from the axis of said elongated housing member, said passage connecting said port to an annular recess formed in the end of said housing member, a valve closure member mounted to said housing member and including a seal member fixed to said valve closure member, said valve closure member and said seal member adapted for relative movement toward and away from said annular recess, whereby said seal member is moved into and out of said annular recess upon separation of said valve closure member and said housing member to thereby open and close said port for the passage of air from said regulator means through said valve means to atmosphere and a spring carried by said housing member and urging said housing member and said valve closure member toward a position closing said annular recess.

3,856,267

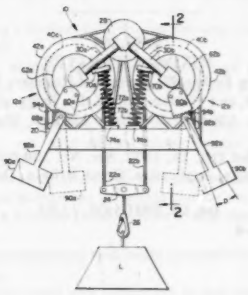
VIBRATION ISOLATOR

William G. Flannelly, South Windsor, Conn., assignor to Kaman Aerospace Corporation, Bloomfield, Conn.

Filed Jan. 12, 1973, Ser. No. 323,038

Int. Cl. B66d *1/26*

U.S. Cl. 254—183 **15 Claims**



1. A vibration isolator for reducing the transmission of vibrations from a winch cable through a winch drum to a supporting structure, the drum being driven rotatably relative to the supporting structure, comprising: a torque-reaction housing rotatably mounted on the supporting structure, the drum being rotatably driven relative to the supporting structure through the housing whereby the driving torque applied to the drum is reacted through the housing to the supporting structure, resilient means connected between the torque-reaction housing and the supporting structure for resiliently restraining rotational movements of the torque-reaction housing relative to the supporting structure; an inertial mass mounted for movement on the supporting structure; and connecting means between the mass and the torque-reaction housing for displacing the mass relative to the supporting structure in accordance with rotational movements of the housing relative to the supporting structure.

3,856,268

HIGHWAY SAFETY DEVICE

John C. Fitch, Falls Village, Conn., assignor to Fibco, Incorporated, Boston, Mass.

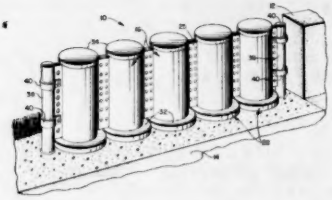
Filed Sept. 17, 1973, Ser. No. 397,618

Int. Cl. E01f *15/00*

U.S. Cl. 256—13.1 **4 Claims**

1. A highway safety device for decelerating or redirecting a vehicle approaching a hazard comprising a vertically elongated deformable hollow metal cell, a lightweight crushable core filling the lower portion of said cell and providing a ground-engaging base for said cell which permits essentially free displacement of said cell upon impact by a vehicle, and a metal crush panel extending diametrically across said cell

along the full length of the portion of said cell above said core means fixedly connecting said panel to said cell, the space



above said core being adapted to contain a dispersible mass such as sand.

3,856,269

MIXING APPARATUS

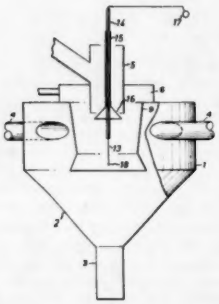
Bernard Henry Fothergill, Barton-on-Humber; Henry Earle, Cumberland, and William John Kelly, Brigg, all of England, assignors to Albright & Wilson Limited, Warley, Worc., England

Filed Oct. 24, 1972, Ser. No. 300,009

Claims priority, application Great Britain, Oct. 25, 1971, 49547/71

Int. Cl. B01f *5/00, 15/02*

U.S. Cl. 259—4 **8 Claims**



1. An apparatus for mixing together liquids and particulate solids, comprising a funnel shaped base having a substantially vertical axis,

fluid injection means for introducing a stream of liquid tangentially into the mixer to establish a continuous vortex in at least the lower part of the funnel shaped base,

solid inlet means for introducing a stream of solid particles into the mixer, and substantially down the axis thereof,

deflection means comprising a corona discharge electrode located substantially at the axis of the funnel, below the level of the solid inlet means and adapted to deflect the solid particles substantially radially outward into the vortex, when the apparatus is in use, to form a mixture of the solid with the liquid, and

an outlet for the mixture at the base of the funnel.

3,856,270

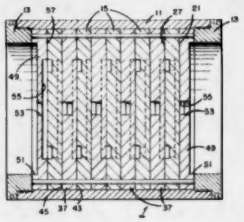
STATIC FLUID MIXING APPARATUS

Herman W. Hemker, West Chester, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Filed Oct. 9, 1973, Ser. No. 404,276

Int. Cl. B01f *15/02*

U.S. Cl. 259—4 **10 Claims**



1. Apparatus for mixing fluids including a series of plates retained in snug face-to-face contacting, fluid-tight relationship each of the alternate plates of such series of plates having a pair of spaced channels in each of the opposite faces thereof and openings extending therethrough connecting the channels in one of said faces with the channels in the other of said faces, the channels in said one face of the respective alternate plates each serving to divide individual streams of fluid into a plurality of separate fluid flows, each of the channels in said other face of the respective alternate plates arranged to receive through openings in such plate a separate fluid flow from each of the channels in said one face and combine the same into an individual stream of fluid, and each of the plates intermediate said alternate plates having a channel in each of the opposite faces thereof and an opening extending therethrough and connecting the channel in one of said faces with the channel in the other of said faces, the channel in said one face of the respective intermediate plates arranged to receive individual streams of fluid from a pair of channels in an adjacent of said alternate plates and direct the same to the opening in such intermediate plate where they are combined into a single stream of fluid, the channel in said other face of the respective intermediate plates serving to divide a single stream of fluid into individual streams and arranged to direct such individual streams to respective channels of a pair of channels in an adjacent of said alternate plates.

3,856,271

MIXING DEVICE FOR GLUING WOOD SHAVINGS

Wilhelm Lodige, Elsener Str. 9c; Fritz Lodige, Leuschner Str. 12, and Josef Lucke, Im Lohfeld 13, all of 479 Paderborn, Germany

Filed Dec. 26, 1972, Ser. No. 318,648

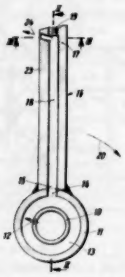
Claims priority, application Germany, Dec. 23, 1972, 2164380

Int. Cl. B01f *7/02, 15/02*

U.S. Cl. 259—25 **12 Claims**

1. A device for mixing wood shavings, fibers and similar mixtures of wood and waste bagasse, especially cellulose containing materials and for simultaneously adding glue thereto, which includes: a hollow rotatable shaft, feeding conduit means arranged within said rotatable shaft in radially spaced relationship thereto so as to define with said rotatable shaft an annular chamber, said feeding conduit means being adapted to be connected to a supply of liquid glue and being provided with passage means therethrough for conveying liquid glue from said feeding conduit means into said annular chamber, and a longitudinal mixing tool connected to and extending outwardly of said rotatable shaft for rotation in a mixing chamber, said mixing tool having an outer free end and being provided with a longitudinal passage communicating with said annular chamber and with outlet passage means

including an outer mouth communicating with said longitudinal passage substantially transverse thereto and leading to the outside of said mixing tool, said outlet passage means being provided near the outer free end of said mixing tool which end



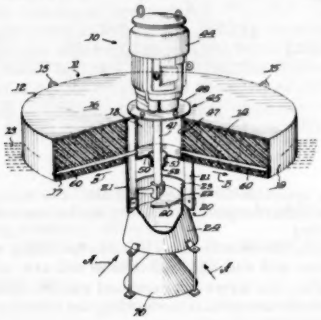
is intended to be immersed into material to be mixed in a mixing chamber, the mouth of said outlet passage means being located on the trailing side of said mixing tool when considering its direction of rotation.

3,856,272

FLOATING MIXER

Richard B. Ravitts, Rockford, Ill., assignor to Richards of Rockford, Inc., Rockford, Ill.

Filed June 8, 1972, Ser. No. 260,851
Int. Cl. B01f *5/12*
U.S. Cl. 259—95 **12 Claims**



1. In a floating liquid mixer adapted to be mounted in a parent body of liquid, the combination comprising:

a float adapted to be supported bouyantly in the parent body of liquid,

said float having a vertically extending passage therethrough,

mixing means positioned below said float adapted to be submerged in the parent body of liquid for agitating the liquid,

drive shaft means connected to said mixing means,

motor means mounted on said float for powering said drive shaft,

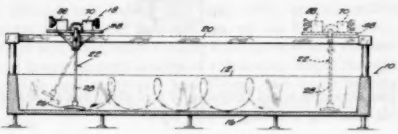
a shield member at the lower end of said passage containing an opening through which said drive shaft means extends, said opening providing a clearance between said drive shaft means and said shield member whereby liquid agitated by the mixing is introduced into said passage, and conduit means between said passage and a location remote from said mixing means for controllong the level of liquid in said passage.

3,856,273

WING TYPE AGITATOR

Billy Leon Born, Rockford, Ill., assignor to Stoelting Brothers Company, Kiel, Wis.

Filed June 25, 1973, Ser. No. 372,963
Int. Cl. B01f *13/00*
U.S. Cl. 259—99 **15 Claims**



1. Apparatus of the type described comprising, in combination,

a vat having a bottom wall, spaced vertical side walls and an open top,

a carriage, means supporting said carriage for horizontal movement relative to said vat generally parallel to said side walls,

a stirring blade assembly extending through said open top into said vat, said stirring blade assembly including a blade member,

means connecting said blade assembly to said carriage for horizontal movement therewith and for oscillating movement in a vertical plane relative to said carriage and said vat,

said means connecting said blade assembly to said carriage including

a rotatable crank arm connected to and rotatably driven by said drive means for said blade assembly,

an elongated support arm connected to said blade member,

means pivotally connecting said support arm to said crank arm,

and guide means connected to said support arm said carriage and movable with said carriage, said guide means supported for pivotal movement about a horizontal axis while permitting sliding movement of said support arm relative thereto so that as said support arm is raised and lowered by said crank arm said support arm can also pivot in a vertical plane generally about the pivot axis of said guide means and oscillate in a horizontal direction,

and drive means for moving said carriage horizontally relative to said vat and for oscillating said blade assembly vertically so that said carriage and said blade assembly can be moved horizontally through a process medium in said vat with said blade assembly also moving vertically.

3,856,274

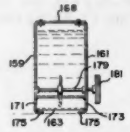
STORAGE TANK

James S. Stevenson, 4230 St. Andrews Rd., Oakland, Calif. 94605

Filed Dec. 15, 1972, Ser. No. 315,295
Int. Cl. B01f *7/02*
U.S. Cl. 259—109 **5 Claims**

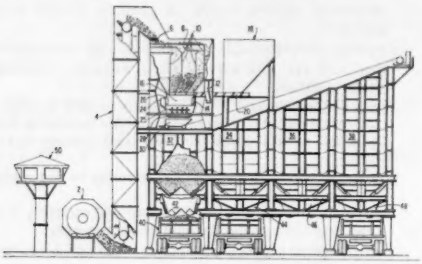
1. A lightweight storage tank applicable for use on a mobile vehicle, comprising a pair of opposing side walls, each comprising a unitary substantially rectangular piece of sheet material, and a one piece bottom and end walls of sheet material disposed between said side walls with said end walls, at their upper edges, terminating in substantially the plane of the upper edges of said side walls, and with said bottom above the lower edges of said side walls, whereby those portions of said

sheet material side walls below said bottom constitute legs for said tank, said legs being arced to provide resilient support for



said tank and avoid fatiguing of said sheet material and possible resulting cracking of said legs.

3,856,275
APPARATUS FOR MAKING AND STORING HOT ASPHALT PAVING MATERIAL
Michael Dydzyk, 11B Queentree Ct., Baltimore, Md. 21207
Filed Nov. 13, 1972, Ser. No. 305,756
Int. Cl. B28c 7/16
U.S. Cl. 259—161 **10 Claims**



1. Apparatus for making and dispensing a hot mix asphalt paving material, comprising

plant means for making batches of hot mix asphalt paving material, said plant means having pugmill means of a given maximum capacity for mixing batches of the constituents of an asphalt paving material and discharging the hot mixed batches thereof through a plant outlet passage;

a first storage bin located directly below the plant means and having an inlet opening for receiving mixed batches discharged through the plant outlet passage, said storage bin being elevated and having an elevated discharge opening at its lower end for releasing paving material into transport vehicles located therebeneath.

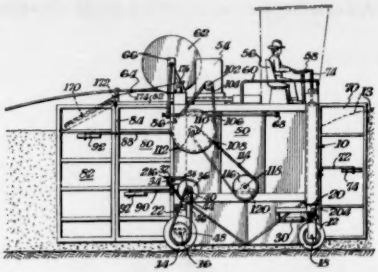
3,856,276
COMPOST PROCESSING MACHINE
Robert T. Pannell, R.D. No. 1, Avondale, Pa. 19118
Filed Sept. 8, 1972, Ser. No. 287,473
Int. Cl. B01f
U.S. Cl. 259—183 **10 Claims**

1. In a compost processing machine for separating, mixing, and stacking fermenting compost, said machine having front and back ends and side walls and being mounted on wheels to facilitate the traversal of a stack of said compost during processing, the improvement comprising:

a rotatable pick-up means mounted between said side walls adjacent the front end of said machine,

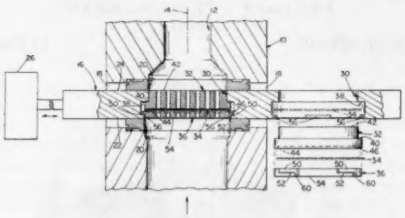
drive means for rotating said pick-up means thereby to lift and move said compost rearwardly as said machine moves forward,

rotatable means having an axis of rotation and at least one planar surface disposed at an angle to said axis of rotation to receive and divert compost from said pick-up means rearwardly and toward the side walls, and



means for rotating said rotatable means at a greater peripheral velocity than that of said pick-up means, thereby to divert, mix and stack said compost at the back end of said machine.

3,856,277
SCREEN ASSEMBLY FOR PROCESSING PLASTIC
Marco Tiramani, Gloucester, Mass., assignor to Gloucester Engineering Co. Inc., Gloucester, Mass.
Filed Sept. 28, 1973, Ser. No. 401,901
Int. Cl. B29b 1/12
U.S. Cl. 259—185 **5 Claims**



1. In apparatus for processing plastic and having a body defining a duct for plastic flow along an axis, a screen changer comprising

a carrier mounted in said apparatus for sliding movement across said duct and transverse to said axis, said carrier having two screen apertures and parallel upstream and downstream surfaces surrounding and extending between said apertures; and

a screen assembly in each said aperture, each screen assembly comprising a breaker plate, a backup plate, and screening sandwiched between said plates;

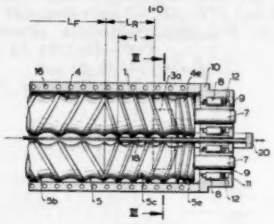
each said breaker plate and said carrier having mating shoulders to locate said breaker plates with their downstream surface in the plane of, and forming extensions of, said downstream surface of said carrier, and to prevent said breaker plates from being forced downstream and out of said carrier by the pressure of plastic flow;

each said backup plate having circumferentially spaced lugs, and said carrier at each said aperture having circumferentially spaced retainer extensions extending into said aperture, said lugs and extensions being arranged to positively locate said backup plates along said axis, said lugs having upstream surfaces spaced axially from the upstream surfaces of their respective plates proper by a distance equal to the axial dimension of said retainer extensions, so that when installed in said apertures said upstream surfaces of said backup plates will be positively located along said axis in the plane of, and forming extensions of, said upstream carrier surface.

3,856,278
TWIN-SCREW EXTRUDER WITH ADJUSTABLE THROTTLING MEANS

Gerhard Eisenmann, Senden, Germany, assignor to Werner & Pfleiderer, Stuttgart, Germany

Filed Oct. 2, 1973, Ser. No. 402,711
Claims priority, application Germany, Oct. 7, 1972, 2249328
Int. Cl. B29f 3/02; B01f 7/08
U.S. Cl. 259—192 **10 Claims**



1. A twin-screw extruder for processing pulverized and pasty material, said extruder comprising:

an elongate housing having at one end a feed opening and at the other end a discharge opening;

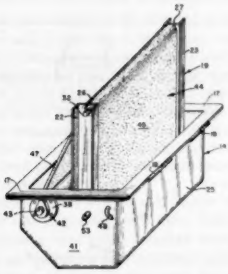
a pair of coacting parallel screws rotatably mounted in the housing for conveying material to be processed in the direction from the feed opening toward the discharge opening, said screws being separated by a lengthwise gap and each of said screws including screw flights pitched for conveying the material in said downstream direction and screw flights pitched to convey the material in opposition to the downstream direction; and

adjustable throttling means for controlling the downstream conveyance of material through the housing, said throttling means including an elongate slidable member interposed in the gap between said oppositely pitched screw flights, said slidable member being lengthwise displaceable relative to said oppositely pitched screw flights.

3,856,279
HUMIDIFIER ASSEMBLY

Richard J. Yeagle, Hartland, Mich., assignor to Skuttle Manufacturing Company, Milford, Mich.

Filed Sept. 21, 1972, Ser. No. 290,808
Int. Cl. B01f 3/04
U.S. Cl. 261—80 **8 Claims**

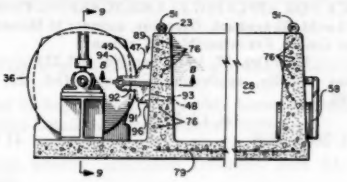


1. A humidifier assembly comprising an open top receptacle adapted to contain a body of water, means for maintaining said water at a predetermined level, a relatively rigid support mounted in said receptacle with its lower end secured to said receptacle and its upper end projecting freely well above the open top of said receptacle, upper and lower idler rollers rotatably mounted on said support on substantially horizontal axes, the lower of said rollers being disposed below water level in the receptacle and the upper roller being disposed an appreciable distance above the open top of said receptacle, a drive roller rotatably mounted on said receptacle above said water level and below the open top of said receptacle upon a fixed substantially horizontal axis that is above the level of said lower roller and laterally spaced therefrom, an external motor unit mounted on a wall of said receptacle operatively connected through said wall to said drive roller, and an endless evaporator pad element mounted around and by said rollers, rotation of said drive roller causing movement of said element to pass a lower element section of substantial length through the water in said receptacle and dispose two water bearing sections thereof above the receptacle in the path of air to be humidified.

3,856,280
MODULAR LIQUID COOLING SPRAY UNITS

Leonard J. Boler, and Mandel L. Desnick, both of Minneapolis, Minn., assignors to Cherne Industrial Inc., Edina, Minn.

Filed Oct. 10, 1972, Ser. No. 296,778
Int. Cl. B01f 3/04
U.S. Cl. 261—90 **28 Claims**



1. A modular liquid cooling spray unit for controlled projection of liquid drops in desired trajectories, particle sizes, velocities, and volume rates providing cooling of the liquid, said modular unit comprising a longitudinally and upwardly extending trough wall portion having a base portion adapted for supporting the trough wall portion at one edge of a reservoir of heated liquid to be cooled, with the trough wall portion having a rear surface adapted to provide at least part of a reservoir boundary wall for maintaining a desired liquid level in such reservoir, a spray member support portion on one of said trough wall and base portions, a plurality of rotary spray members mounted on said spray member support portion for rotation on a horizontal axis spaced in front of and parallel to the trough wall portion, with at least a portion of each spray member spaced vertically below the desired level of heated liquid in such reservoir, and conduit means in said trough wall portion for feeding liquid from said reservoir through said trough wall portion to at least one surface of each spray member at a limited area which is below said desired liquid level and from which the rotation of the spray members carries liquid and projects liquid drops in a plurality of trajectories substantially all of which have horizontal components extending generally crosswise of said trough wall portion.

3,856,281

DEVICE FOR COOLING HOT ROLLED METALLIC STRIPS

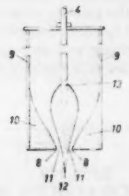
Nino Bertolotti, Tirrenia; Bruno Sabatini, and Giuseppe Mocci, both of Rome, all of Italy, assignors to Centro Sperimentale Metallurgico S.p.A.

Filed July 10, 1972, Ser. No. 270,292

Claims priority, application Italy, July 17, 1971, 51720/71; June 22, 1972, 51091/72

Int. Cl. C21d 1/62

U.S. Cl. 266—3 R 18 Claims



1. A device for cooling hot rolled metallic strip by means of water directed against a strip moving rapidly between the last finishing stand of a strip mill and a coiler. comprising a cooling water distributing box having inner side walls that converge downwardly and terminate downwardly in a slit that extends generally transverse to the path of movement of the strip, said side walls having upper concave portions and lower convex portions adjacent said slit.

3,856,282

DEVICE FOR APPLYING FLAME-SCARFING POWDER

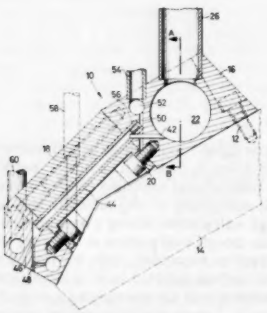
Alfred Lucht, Bickenbach, Germany, assignor to Messer Griesheim GmbH, Frankfurt/Main, Germany

Filed Oct. 17, 1973, Ser. No. 407,273

Claims priority, application Germany, Oct. 21, 1972, 2251788

Int. Cl. B23k 7/08

U.S. Cl. 266—23 H 11 Claims



1. In a device for applying flame-scarfing powder to the surfaces of work pieces to be flame-scarfed with a conduit for supplying the powder from a storage container into a chamber in the device and with an outlet conduit connected with the chamber through which the powder may be supplied with the aid of a conveying medium to the work piece surface, the improvement being said powder supply conduit having at least two branches, one of said branches terminating in about the center of said chamber, the other of said branches being connected to the frontal side of said chamber, said outlet conduit being in the form of a plurality of side by side outlet channels, and each of said channels communicating with said chamber.

3,856,283

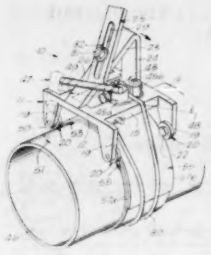
PIPE CUTTING AND BEVELING TOOL

James R. Johnson, 7808 Allengrove St., Downey, Calif. 90240

Filed Dec. 27, 1972, Ser. No. 318,874

Int. Cl. B23k 7/04, 7/10

U.S. Cl. 266—23 NN 8 Claims



1. Apparatus for cutting and beveling a pipe comprising:

a strip of flexible material having a smooth hard surface for wrapping about the surface of a pipe for more than one turn with the sides of the successive wrappings aligned;

a mount for supporting a cutting torch, said mount adapted to be positioned on the surface of the pipe with at least one of the side surfaces thereof contacting the sides of said wrappings; and

flexible means for holding said mount against the surface of the pipe by interconnecting the ends of the mount while lying against the surface of the strip;

whereby said mount can be advanced about the surface of the pipe while being guided by the sides of said wrappings and while said flexible means slips about the surface of said strip.

3,856,284

CONTAINER FOR HOT LIQUID METALS

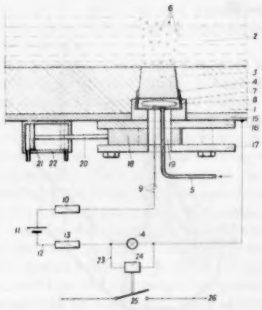
Otto Hoyer, Linz, Austria, assignor to Vereinigte Osterreichische Eisen-und Stahlwerke Alpine Montan Aktiengesellschaft, Vienna

Filed Aug. 20, 1973, Ser. No. 389,532

Claims priority, application Austria, Aug. 21, 1972, 7183/72

Int. Cl. C21c 7/00

U.S. Cl. 266—34 PP 2 Claims



1. A container for hot liquid metals comprising a refractory lining and a bottom in which a porous, gas-permeable, refractory stone is inserted to which a conduit is joined through which a gas is blown into the liquid metal, the gas conduit at least in the area below the porous stone being made of an easily separable material, and further comprising a slide with

a bore below said porous stone, the gas conduit extending within said bore, and an actuating means for closing the bore which is connected with said slide, and below the porous stone a feeler which is sensitive to metal outbreaks.

3,856,285

SHOCK ABSORBING APPARATUS

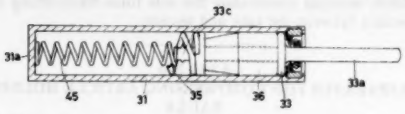
Akio Yamada, 20-21 Suehiro 1-chome, Ichinomiya, Japan

Continuation-in-part of Ser. No. 271,914, July 14, 1972, abandoned. This application Dec. 26, 1973, Ser. No. 427,638

Claims priority, application Japan, July 16, 1971, 46-52990; May 15, 1972, 47-47873

Int. Cl. B60g *13/02, 15/04*

U.S. Cl. 267—9 C **11 Claims**



1. A vehicular collision impact absorbing apparatus comprising:

a hollow elongate casing open at one end and closed at the other end, said open end having a closure means;

an elongate elastically deformable component positioned in said casing and having an axial hole therethrough, said deformable component comprising a cylindrical portion toward one end and a tapered portion toward the other end, said cylindrical portion having an outer peripheral surface in contact with the inner surface of said casing, said deformable component having an overall length satisfying the formula $S/S' < \mu$, where S represents the cross-sectional area of said cylindrical portion, S' represents the outer peripheral surface area of said deformable component and μ represents the cooefficient of friction between the inner surface of said casing and said outer surface of said deformable component, said tapered portion having a length equal to one-third to two-thirds of said overall length of said deformable component, and a minimum outer diameter equal to the outer diameter of said cylindrical portion less one-third to two-thirds of the difference between the outer diameter of said cylindrical portion and the diameter of said axial hole;

a piston positioned in said casing and having one side contacting said one end of said deformable component;

a first piston rod connected at one end to said one side of said piston and extending through said axial hole of said deformable component, said first piston rod having a diameter slightly smaller than that of said axial hole;

a second piston rod connected at one end to the other side of said piston and extending in a direction opposite to said first piston rod, said second piston rod slidably extending through said open end of said casing, and the other end of said second piston rod serving as a means for fastening the apparatus to a vehicle;

a guide member provided slidably inside said casing and having one side contacting said other end of said deformable component, said guide member being centrally provided with an opening which is coaxial with said axial hole of said deformable component and through which said first piston rod slidably extends; and

elastic support means positioned in said casing and interposed between said closed end of said casing and the other side of said guide member to press against said guide member for restoring said deformable component to a beginning position.

3,856,286

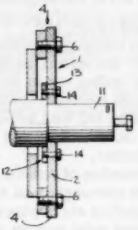
TORSION BAR PLATE

William Mitchell, Baldwin, N.Y., assignor to Motion Mini Car Corp., Baldwin, N.Y.

Filed June 12, 1973, Ser. No. 369,311

Int. Cl. F16f *1/16*

U.S. Cl. 267—57 **2 Claims**



1. A torsion bar assembly comprising a torsion bar, a torsion bar plate, means for supporting said torsion bar on said torsion bar plate means for supporting the torsion bar plate on a frame, said torsion bar plate comprising a substantially flat plate having an opening therein to support the torsion bar, said torsion bar plate also comprising end edges and side edges, bolt openings being provided in the corners formed by the edges, said bolt opening being adapted to accommodate means for mounting the plate at same frame, a spacer assembly is provided around the opening, said opening is located substantially centrally on said plate, said spacer assembly being a ring removably bolted to the plate around the opening.

3,856,287

PISTON ROD SEAL FOR ADJUSTABLE PNEUMATIC SPRING

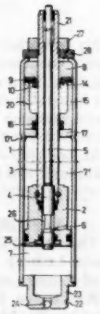
Herbert Freitag, Koblenz-Metternich, Germany, assignor to Stabilus GmbH, Koblenz-Neuendorf, Germany

Filed June 20, 1973, Ser. No. 371,768

Claims priority, application Germany, June 24, 1972, 2231050

Int. Cl. F16f *5/00*

U.S. Cl. 267—64 R **9 Claims**



1. A pneumatic spring comprising:

a. a cylinder having an axis and bounding a cavity therein;

b. a piston axially slidable in said cavity and separating two compartments of said cavity,

c. valve means operatively interposed between said compartments;

d. valve operating means accessible outside said cavity for moving said valve means toward and away from an open position in which said valve means connects said compartments; e. a piston rod fixedly fastened to said piston and axially extending therefrom outward of said cavity, said cylinder including an end wall transverse to said axis and formed with an aperture for passage of said piston rod;

f. fluid filling said cavity; and

g. sealing means interposed between said end wall and said piston rod for preventing escape of fluid through said aperture, said sealing means including:

1. a rigid tubular member substantially coaxially enveloping said piston rod with sufficient clearance to permit free axial movement of said piston rod through said tubular member,

2. a sealing member of resilient material formed with an opening therethrough, said tubular member having a first axial portion enveloping said rigid tubular member and a second axial portion extending axially beyond said tubular member in a direction inward of said cavity,

3. said second portion having a radially outer, axially extending face radially spaced from said cylinder and exposed to said fluid,

4. the radially innermost part of said second portion constituting a lip portion, said lip portion being the only part of said sealing member frictionally engaging said piston rod.

3,856,288

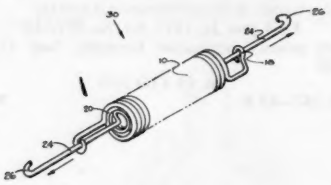
MULTISTAGE SPRING ASSEMBLY

Bernard V. Alvarez, Rt. 1, Box 32, Inman, S.C. 29349

Filed Dec. 13, 1973, Ser. No. 424,472

Int. Cl. F16f *1/12*

U.S. Cl. 267—73 **15 Claims**



1. A spring assembly comprising a pair of extension type coil springs in operative association, a first of said springs having stop means integral therewith and a second of said springs having means integral therewith guiding said second spring into contact with said stop means, said second spring being individually extended upon receipt of an axial force thereon to contact with said stop means and thereafter simultaneously extended with said first spring.

3,856,289

FORCE TRANSMITTING SYSTEM

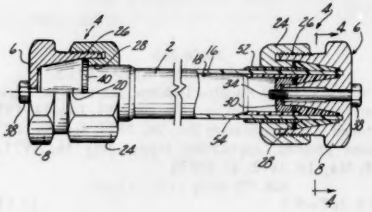
Wallace Lee Roy Steele, Lathrup Village, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 155,697, June 23, 1971,. This application Mar. 29, 1973, Ser. No. 346,197

Int. Cl. F16f *1/16*

U.S. Cl. 267—154 **18 Claims**

1. In a torsional force-transmitting system: a low modulus torsion tube having at least one terminal side surface defined by spaced parallel planes A and B normal to the tube axis; a high modulus anchor having at least one axially tapered side surface radially aligned with the tube's terminal side surface; and elastic force-transmitting material interposed between



each terminal side surface and each tapered side surface; said elastic material constituting the sole force-transmitting connection between the tube and anchor.

3,856,290

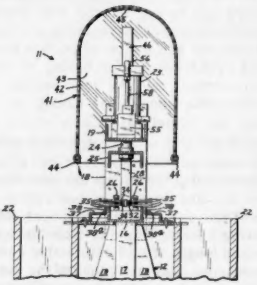
APPARATUS FOR COMPRESSING ARTICLE HOLDING RACKS

Dennis H. Jensen, New Brighton, and Thomas E. McKinley, Minneapolis, both of Minn., assignors to M J Manufacturing Consultants, Inc., Minneapolis, Minn.

Filed Mar. 15, 1973, Ser. No. 341,474

Int. Cl. B25b *1/18*; **C23b** *5/70*

U.S. Cl. 269—14 **22 Claims**



1. Apparatus for compressing article holding racks having a plurality of resilient finger pairs arranged in opposed, longitudinal rows, the fingers of each pair being mutually compressible to receive and retain an article, said apparatus comprising:

a. a frame comprising an overhead support member;

b. a first clamping member carried by the frame in a stationary position and constructed to engageably receive one finger of each finger pair;

c. a second clamping member carried by the frame for movement relative to the first clamping member in clamping relation therewith, the second clamping member constructed to depressibly engage the other finger of each finger pair;

d. the first and second clamping members comprising elongated channel members disposed horizontally below said overhead support member with their channels in opposed relation;

e. power means comprising at least one actuator mounted on the overhead support member for moving the second channel member between clamping and non-clamping positions, the second channel member being operatively connected to the actuator for vertical movement thereby;

f. shield means carried by the frame means for vertical

movement between a first position protectively surrounding the clamping members and a second position permitting accessibility thereto;

g. and means for controlling movement of the power means, the controlling means incldng switching means engageable by the shield means in said second position to initiate movement of the second clamping member to said clamping position.

3,856,291

PRESSING MEANS FOR USE IN GLUEING CONSTRUCTION PANELS TO A BASE

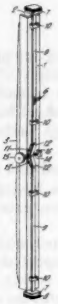
Tor Noldus Nilsen, Ostrevei 25, 3150 Tolvsrod, Norway

Filed Sept. 7, 1973, Ser. No. 395,056

Claims priority, application Norway, Sept. 20, 1973, 3375/73

Int. Cl. B25b *11/00*

U.S. Cl. 269—22 **1 Claim**



1. Pressing means for use when glueing construction panels and the like to a preferably vertical base, particularly to vertical posts in a building construction, characterized by an elongate channel profile (**1**) with an inflatable rubber tube (**3**) arranged in the profile cavity (**2**) and extending substantially along the entire length of the profile, and in that at the end of the profile (**1**) feet or blocks (**7**) are arranged for securing of the profile between two points, for example, floor and ceiling in a building construction, each foot (**7**) being secured to a rod (**9**) which is movably mounted in the longitudinal direction of the profile, a knee band approximately at the center of the profile (**1**), between the ends of the two rods (**9**), the two free ends (**12**) of said knee bend being secured to the free ends of the rods (**9**), a threaded sleeve through which a spindle (**14**) is passed at the branching point of said knee bend, said spindle being at one end mounted freely rotatable to the profile and, at its other end, having a control wheel (**15**).

3,856,292

RETENTION OR VISE COMBINATION

Anthony Merola, Pittsburgh, Pa., assignor to Amerola Products Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 825,369, May 16, 1969, Pat. No. 3,653,708. This application Nov. 10, 1971, Ser. No. 197,222

Int. Cl. B23q *3/00*

U.S. Cl. 269—135 **3 Claims**

1. A vise comprising:

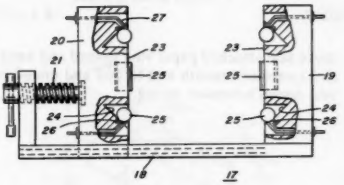
a. a base;

b. a pair of jaw members having confronting generally flat, parallel faces, one of said jaw members being movably mounted to said base and the other of said jaw members being fixably mounted to said base;

c. adjusting means mounted to said base and to said movably mounted jaw member in order to vary the span between said confronting faces and to apply force in order to engage a workpiece disposed therebetween;

d. at least one recess formed in each of said confronting jaw faces, a recess in one jaw face being positioned generally opposite a corresponding recess in the other jaw face, an inclined surface being provided in each recess such that each corresponding pair of recesses confront each other such that the inclined surfaces converge in one direction and diverge in the other;

e. a friction roller disposed in each recess and resiliently attached to its associated inclined surface by resilient



means such that the roller contacts the inclined surface of the recess, the rolling axis of the roller being parallel to the inclined surface, to permit movement of the roller in the directions of convergence and divergence said friction roller being retained such that in a rest position it projects partially beyond the recess in which it is mounted, and in a workpiece engaging position, each roller engages and restrains movement of the workpiece in the direction of convergence of the inclined surface, each roller, recess and resilient means being arranged such that each roller may recede into its recess upon application of sufficient force by the adjustment means, whereby the face of the jaws may be brought into engagement with the workpiece.

3,856,293

AUTOMATED FOLD PAN

Harold E. Boyer, Anna, Ohio, assignor to Bell and Howell Company, Sidney, Ohio

Filed Dec. 14, 1972, Ser. No. 314,923

Int. Cl. B65h *45/14*

U.S. Cl. 270—68 A **20 Claims**

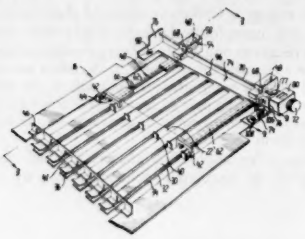
1. A fold-pan assembly for attachment to a sheet folding machine comprising:

a pair of parallel spaced plates defining a space therebetween with a sheet-entrance mouth at one end thereof;

a fold-controlling paper stop disposed in said space movable toward and away from said sheet-entrance mouth;

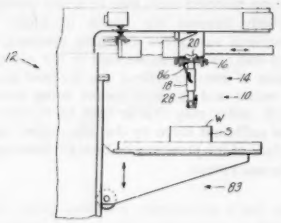
a crown extension spring attached to said paper stop, said crown extension spring normally having a stored coiled portion and a non-coiled extended portion having an end attached to said paper stop; and

a paper-stop adjusting means rigidly engaging said extended portion for moving said extended portion to thereby



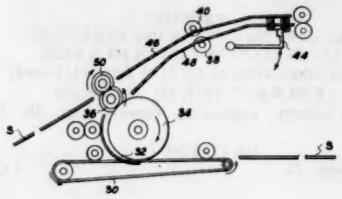
move said attached paper stop toward and away from said sheet-entrance mouth and to coil and uncoil portions of said crown extension spring.

3,856,294
MECHANISM FOR SEPARATING FLEXIBLE PLIES FROM A STACK
Carlton G. Lutts, and James R. Stewart, both of Salem, Mass., assignors to USM Corporation, Flemington, N.J.
Filed June 6, 1972, Ser. No. 260,306
Int. Cl. B65h *3/00*
U.S. Cl. 271—10 **4 Claims**



1. In a machine for transferring single plies of flexible sheet material from the exterior of a stack and having at least one pick-up device, a ply separating mechanism comprising a reciprocable piston for carrying the pick-up device toward and from the stack, a tubular body slidably mounting the piston and providing a first chamber therebetween the piston and the body having a pin and helical slot connection, the slot extending heightwise of the stack with inclination to cause the device to impart torsion to a locality of a top ply for facilitating its initial separation from the stack, a second chamber disposed between the piston and the pick-up device, and control means for changing fluid pressure in the first chamber to effect cooperation between said pin and slot and thereby shift the pick-up rotatively and away from the stack when the top ply has been seized, said control means being adapted to change fluid pressure in the second chamber on arrival of the pick-up device with the top ply at a delivery position to effect work release by the device.

3,856,295
INVERTER-REVERSER FOR A REPRODUCTION MACHINE
John H. Looney, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 28, 1973, Ser. No. 429,252
Int. Cl. B65h *29/60*
U.S. Cl. 271—65 **7 Claims**



1. A reproduction system for producing single sided and double sided copy comprising:

a reproduction machine including a first sheet handling means and a second sheet handling means for feeding sheets seriatim through said reproduction machine to produce copy thereon;

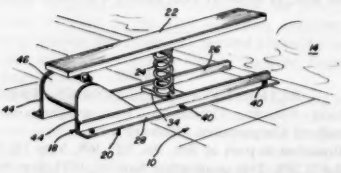
transport means associated with said reproduction machine for transporting sheets having copy thereon through a first path to a location external of said reproduction machine;

deflector means associated with said transport to deflect copies from said transport along a second path to said second sheet handling means;

resilient stop means adapted for movement into said second path for contacting the leading edge of a sheet passing therethrough to stop the sheet and reverse the direction of movement thereof; and

feed means adapted for contact with the edge of the sheet opposite the edge contacted by said stop means for feeding the sheet into said first path for delivery of the sheet to a location external of said reproduction machine.

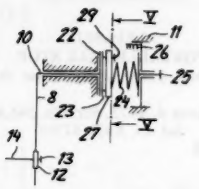
3,856,296
DIVING BOARD CONSTRUCTION
Henry V. Fischer, R.F.D. No. 1, Tipton, Mo. 65081
Filed Jan. 7, 1974, Ser. No. 431,483
Int. Cl. A63b *5/10*
U.S. Cl. 272—66 **5 Claims**



1. A diving board construction including an elongated base defined by a pair of elongated horizontal spaced apart opposite side members, transverse brace means extending between

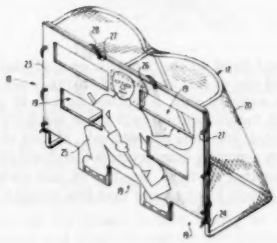
and rigidly secured to mid-portions of said side members, one pair of ends of said side members including upstanding mounting plates secured thereto and extending longitudinally therealong, a large diameter horizontally disposed tubular combined brace and support member extending between and rigidly secured to said plates, a pivot shaft supported from, spaced slighly above and extending along said tubular member, and a diving board extending along and overlying said base in spaced relation thereto, with one end of said board overlying said pivot shaft, means supporting said one end of said board from said pivot shaft, upstanding compression spring means interposed between said transverse brace means and an under surface portion of a mid-portion of said board disposed above said brace means, and a pair of upstanding eye bolts secured downwardly through opposite end portions of said tubular member and having horizontally aligned upper end eye portions through which the opposite ends of said pivot shaft extend.

3,856,297
FRICTIONAL TYPE EXERCISING DEVICE
Josef Schnell, 8889 Peutenhausen, Germany
Filed Mar. 19, 1973, Ser. No. 342,734
Claims priority, application Germany, Mar. 20, 1972, 2213440
Int. Cl. A63b *21/00, 23/00, 23/04*
U.S. Cl. 272—79 D **13 Claims**



1. An exercise apparatus comprising:
a support including a pair of horizontally spaced upright frames;
respective horizontal actuating shafts rotatable on each of said frames;
a respective crank arm attached to each of said shafts and lying in a vertical plane formed by rotation of said respective crank arm along an inner side of each frame between a user and one of the upright frames, said arms being displaceable through arcs of approximately 180° by a person positioned between said frames to rotate said shafts;
respective horizontal load shafts journaled on said frames;
respective force receiving members affixed to each of said load shafts externally of said frames and rotatble in respective vertical planes;
a large-diameter gear on each of said load shafts;
a small-diameter gear on each of said actuating shafts in mesh with the respective large-diameter gear;
means for applying a variable force to said force-receiving members; and
means enabling decoupling of each actuating shaft from the respective load shaft to permit relative angular displacement of said actuating shafts independently of the respective load shafts allowing rotation of only a single actuating shaft and its associated load shaft when a user acts on one of said crank arms, the meshing gears being dimensioned for maintaining a generally uniform torque therebetween in at least one direction over said arcs; and
means connected to said first means for varying said torque means removably attachable to the crank arms so that both arms may be rotated in unison when a user applies a force thereto through an are during an exercise program.

3,856,298
HOCKEY PRACTICE APPARATUS
Paul R. Frantti, 123 Wyandott St., Laurium, Mich. 49913
Filed Jan. 14, 1972, Ser. No. 217,801
Int. Cl. A63b *69/00*
U.S. Cl. 273—1 B **2 Claims**

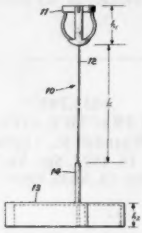


1. Game apparatus for practicing skills or for demonstrating competence in the game of hockey comprising:
a. a game playing surface in the form of an ice hockey rink,
b. a plurality of markers located in the center portion of the playing surface, said markers having equal spacing between successive markers and being aligned on a line which is parallel to the sidelines of the playing surface,
c. a box-shaped receptacle positioned adjacent one sideline of the playing surface, said receptacle being provided with cleats for maintaining contact with the surface of the ice and having an opening located in its lower portion at the level of and facing onto the playing surface for entry by a hockey puck into the receptacle, and
d. a hockey goal positioned at at least one end of the playing surface and having attached to its front portion a barricade member which blocks entry into the goal, said barricade member having the figure of a goalie located on the center portion of the barricade member facing onto the rink, and a plurality of openings located in the barricade member and positioned around the periphery of the figure of the goalie, said openings being of a size sufficient to allow a hockey puck to pass through said barricade member.

3,856,299
FINGER GAME
Massud K. Ghovanloo, 241 Shoreward Dr., Great Neck, N.Y.
Filed May 15, 1972, Ser. No. 253,019
Int. Cl. A63f *9/00*
U.S. Cl. 273—1 M **6 Claims**

1. A finger game adapted to be used when suspended from fingers of a user's hand, the game comprising at least two

assemblies, each of which comprises a finger thimble of resilient material which defines a bottom end, and an open top end for accommodating a finger of a user inserted in the open end, a three-dimensional element having a center of gravity and having a junction part above said center of gravity when the element is in upright orientation, and a filament having its length substantially greater than its diameter, said filament having a first end fixed to the bottom of said thimble, and a



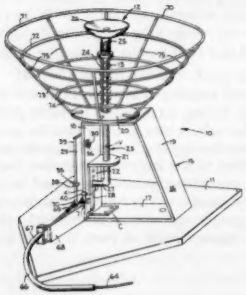
second end fixed to the junction part of said element, the element of one of said assemblies having, when upright, on at least one exposed side, a mating surface of predetermined shape and the element of each other assembly having, when upright, on at least one exposed side, mating surface having a shape that generally complements the shape of a mating surface of another element, any two of said elements when in mating position having more than line contact.

3,856,300

BALL TOSSING DEVICE

David Payne, 488 Coakley Dr., San Jose, Calif. 95117

Filed Nov. 26, 1973, Ser. No. 418,829
Int. Cl. A63b 69/40
U.S. Cl. 273—25 5 Claims



1. In a ball tossing device of the type having a spring loaded ball supporting tee and releasable latching means therefor, the combination of:

a. a base simulating homeplate;

b. a ball supporting tee mounted on said base including a U-shaped strap material frame having a bight portion secured to the base, one leg portion extending upwardly therefrom adjacent approximate center of the base, the other leg portion of such frame extending diagonally upward as a brace; and a disc mounted on the upper ends of said legs in parallel relation to said base and concentric to center thereof;

c. a bracket secured to said one leg portion and having a flange extending laterally therefrom substantially parallel to and midway between the bight portion of said frame and said disc, said disc and flange each having concentrically aligned bores formed therethrough in vertical alignment above the center of the base;

d. a plunger bar arranged in the aligned bores of said disc and flange for up and down guided movement relative thereto;

e. a ball supporting cup threadedly mounted on the upper end of said plunger bar;

f. a compression spring circumscribing said plunger bar between said ball supporting cup and said disc for urging said plunger bar upwardly relative to the latter;

a foot extending laterally from said plunger bar;

h. a slot formed vertically in said one leg portion of said frame for receiving the foot of said plunger bar therethrough and for limiting up and down movement of said bar relative to said frame.

h. a spring loaded latch lever mounted on said one leg portion for engaging the foot of said plunger bar and for maintaining the latter in its lowermost condition against the action of said compression spring.

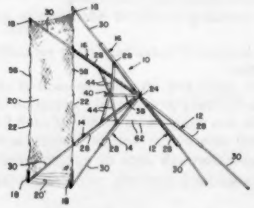
i. remote control means separate from said base and ball supporting tee, including a flexible cable having one end secured to said ball supporting tee and its opposite end spaced therefrom for remotely controlling said latch lever to release the latter from latching engagement with the foot of said plunger bar and for facilitating removal said base and ball supporting tee from home plate position after a ball on said ball supporting cup has been tossed upwardly therefrom.

3,856,301

PORTABLE BALL STOP

William A. Davidson, 2208 S. Invernesse Way, Coupeville, Wash. 98230

Filed June 4, 1973, Ser. No. 366,625
Int. Cl. A63b 67/00
U.S. Cl. 273—55 B 6 Claims



1. A portable ball stop, comprising:

an umbellate net supporting frame comprising a rear hub

member, four support arms extending forwardly from said rear hub member in an umbellate relationship and terminating in free end portions, pivot pin means pivotally connecting the support arms to said hub member, a support stem for a brace assembly rigidly attached to said rear hub member and extending axially forwardly therefrom, and a collapsible brace assembly for the support arms comprising a ring member surrounding said stem and being slidable axially therealong, and four radial brace members, each of which is pivotally connected at one of its ends to the sliding ring member and is pivotally connected at its opposite end to the rear part of one of the support arms at a location on such rear part spaced from the hub member a distance slightly greater than the length of such brace arm;

a pair of laterally spaced apart line members in tension interconnected between the free end portions of said support arms;

a net supported by and between said line members, said net having a vertical dimension that is substantially larger than the length of said line members;

means securing the upper portion of said net to said stop;

slide connector means along the sides of said net slidably attaching said net onto said line members below said upper portion so that a ball striking said net at an upwardly directed angle will move the net vertically, to absorb the momentum of the ball, as well as rearwardly into the space between said support arms; and

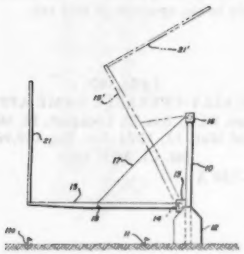
a rear prop connected to the umbellate frame, for holding it in a position placing the net generally vertical.

3,856,302

FOOTBALL GOAL POSTS

George E. Karkoska, Berwyn, Ill., assignor to G.E.K. Enterprises, Inc., Chicago, Ill.

Filed Aug. 8, 1973, Ser. No. 378,796
Int. Cl. A63b *67/00*
U.S. Cl. 273—55 R **7 Claims**



1. A football goal post for use as a field goal and extra point scoring target comprising:

a horizontal bar with two vertically directed bars attached to said horizontal bar and forming a U-shaped target means;

goal post support means adapted for anchoring to the ground;

an elongated boom pivotably connected to said goal post support means at one end and connected to the horizontal bar of said U-shaped target means at its opposite end and having a first position wherein said U-shaped target means is in its scoring target position; and

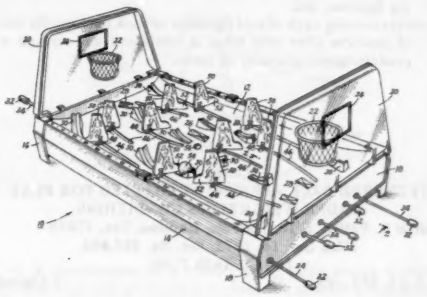
means for pivoting said boom about its pivotable connection to said goal post support means to a second position at an angle above the horizontal.

3,856,303

BASKETBALL GAME

Calvin L. Payne, Jr., Hastings-on-Hudson; Vincent J. Gambello, New York, both of N.Y., and John A. Molnar, Fairfield, Conn., assignors to Tudor Games, Incorporated, Brooklyn, N.Y.

Filed Apr. 12, 1973, Ser. No. 350,307
Int. Cl. A63f *7/10, 7/14*
U.S. Cl. 273—85 B **4 Claims**



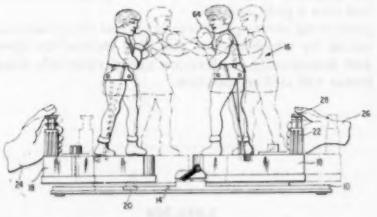
1. An indoor basketball game comprising a board surface having a plurality of slots and ramps in said surface, slidable ball propelling rods disposed underneath said surface, means for supporting the operative end of said rods, said means extending through said slots and having ball contacting arms operable rotatively and in translation by means of said rods to contact a ball over said surface, and a simulated basket mounted over each end of the board surface, a plurality of ramps disposed on the board surface having an upwardly inclined, elongated and relatively narrow ball guiding surface constituting a passage oriented in the direction of one of said baskets, said passage having an upwardly inclined slope the angle of which is dependent on the distance from the basket toward which it is oriented, said ramps being open ended and having its ball entering and lowermost end located on the level of said board surface.

3,856,304

BOXING GAME

Takao Matsumoto, and Masaru Aoki, both of Tokyo, Japan, assignors to Tony Kogyo Company, Ltd., Tokyo, Japan

Filed Apr. 30, 1973, Ser. No. 355,728
Claims priority, application Japan, May 10, 1972, 47-54809
Int. Cl. A63f *9/14*; A63h *13/06*
U.S. Cl. 273—85 F **7 Claims**



1. A boxing game comprising:

a base;

two housings, means mounting said housings for movement on said base, said housings being provided with handles having actuator members;

boxing figurines mounted on said housings in opposed relationship, each of said figurines having arms, means causing said arms to extend outwardly, a torso and means causing said torso to rock when contacted;

means operatively connecting said actuator members of said housings to said means causing said arms to extend outwardly of said figurines;

means counting and recording the number of times said torso of each of said figurines is rocked as a result of being contacted by at least one of the arms of the opposing figurine; and

means causing each of said figurines to rock backwardly out of position after said torso is contacted and rocked a predetermined plurality of times.

3,856,305

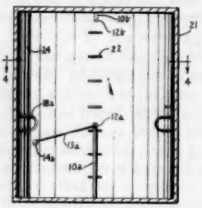
TETHERED BALL APPARATUS ADAPTED FOR PLAY UNDER WEIGHTLESS CONDITIONS

Curtis E. Vetter, 1710 Gunwale, Houston, Tex. 77058

Filed Oct. 10, 1972, Ser. No. 295,808

Int. Cl. A63b *71/02*

U.S. Cl. 273—95 A **7 Claims**



1. Game apparatus comprising:

a. a space station,

b. a gravity free chamber provided within said station,

c. a tethered ball,

d. a centrally disposed support means within the chamber,

e. swivel means disposed on the support means,

f. said ball tethered to said swivel means constraining the ball to follow an orbit as directed by the impact of a game player,

g. racket means to impact the tethered ball,

h. goal means positioned at a distance spaced from said support means, the distance being slightly shorter than the length of the tether such that a player can direct the ball into a goal, and

i. positioning means peripherally spaced about said support means by which players may pull themselves upwardly and downwardly in elevation and peripherally toward a better ball striking position.

3,856,306

TARGET, INDICATOR AND TETHERED PROJECTILE

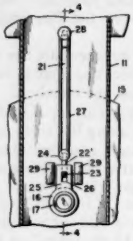
Victor Petrusek, 18511 Gottschalk, Homewood, Ill. 60430

Filed July 9, 1973, Ser. No. 377,406

Int. Cl. A63b *72/01*

U.S. Cl. 273—98 **2 Claims**

1. In a target game apparatus, the combination of a vertically elongated housing adapted to be mounted on a vertical supporting surface, a target provided on the lower portion of said housing and including a depressible button, resilient means in said housing biasing said button to its undepressed position, a bell provided in the upper portion of the housing in spaced relation from said button, said housing having guide means extending vertically from said button toward said bell, said guide means constituted by a slot formed in said housing, a striker movable along said guide means with a portion thereof projecting into said slot and slidable therein, coacting keeper means provided on said projecting portion of said



striker and on said button for releasably retaining the striker at a point on said guide means adjacent said button when the button is undepressed, resilient means for propelling said striker along said guide means to impact said bell when said keeper means are released by depressing of the button, an aerial projectile cooperable with said target button, an elongated elastic element tethering said projectile to said bell, said releasable keeper means comprising an apertured tab provided on said button in said housing, and a bevelled detent provided on said projecting portion of said striker, said detent being receivable in the aperture of said tab.

3,856,307

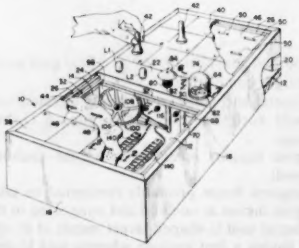
ELECTRICALLY-OPERABLE GAME APPARATUS

Hugh J. Tinman, Rt. 2, Box 79, Lockport, Ill. 60441

Filed Mar. 11, 1974, Ser. No. 449,968

Int. Cl. A63f *3/00*

U.S. Cl. 273—134 A **12 Claims**



1. A game apparatus comprising a playing board having designated locations thereon, a playing piece embodying a

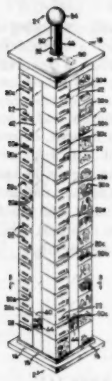
magnet and adapted for selective positioning on said locations, a normally open, magnetically-responsive, circuit-making and breaking switch disposed beneath each of said locations and effective when the playing piece is positioned on the super-jacent location to become closed, an electrically-energizeable signal device connected to all of said switches, an indexable distributor mechanism having a series of contacts, one for each switch, said contacts being electrically connected to said signal device, said distributor mechanism further including a movable wiper arm adapted to traverse said contacts successively upon indexing of the distributor mechanism, a pair of electric leads adapted for connection to a source of electric current, one of said leads being connected to all of said switches, the other lead being connected to said wiper arm, and manually-operable means for indexing said distributor mechanism.

3,856,308

THREE DIMENSIONAL GAME APPARATUS

Jeffrey D. Breslow, Highland Park, and Kathy A. Dunn, Chicago, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 1, 1973, Ser. No. 328,874
Int. Cl. A63f 3/00
U.S. Cl. 273—135 R **10 Claims**



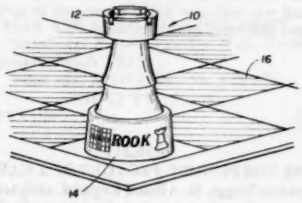
1. A game apparatus comprising, in combination:
an upright column resembling an elevator shaft having a plurality of playing positions for receiving playing pieces;
a plurality of playing pieces positionable at said playing positions;
complimentary indicia means at said playing positions and on said playing pieces, whereby each playing piece is correlated to at least one of said playing positions;
a set of instruction cards for determining the play of said playing pieces at said playing positions; and
plunger means vertically reciprocally movable within said column, said plunger means having simulated elevator means thereon and wherein said column has a portion adjacent the path of said simulated elevator means through which a player can visually observe the elevator means from the outside of said column.

3,856,309

CHESS PIECE WITH REMOVABLE INSTRUCTIONAL BASE

Saul Helfgott, Lindenhurst, N.Y., assignor to Field Manufacturing Co., Inc., Lindenhurst, N.J.

Filed Apr. 8, 1974, Ser. No. 458,719
Int. Cl. A63f 3/02
U.S. Cl. 273—137 R **6 Claims**



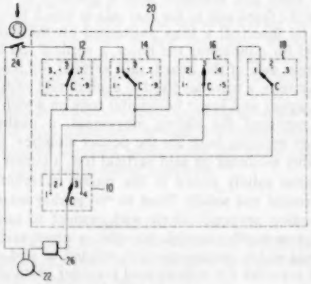
1. A combination of a chess playing piece having a sized circular base and an attached explanatory base for a beginning player for said playing piece that is removable from said attachment therewith when used by an experienced player, said explanatory base comprising a body having an upper surface and a side surface, said side surface having instructions relating to the movement of said chess playing piece displayed thereon, and said upper surface having a sized circular depression formed therein adapted to engage in a force fit said circular base of said chess playing piece, whereby said explanatory base is only removably attached to said chess playing piece.

3,856,310

ELECTRICAL CIRCUIT HAVING AN ODDS SELECTOR FOR A GAME OF CHANCE

Ken E. Sniderman, 1930 Riverside Dr., Trenton, N.J. 08618

Filed Jan. 8, 1974, Ser. No. 431,755
Int. Cl. A63b 71/06
U.S. Cl. 273—138 A **1 Claim**



1. A chance game device comprising an electric circuit including a power source and win indicator, the input of said electric circuit connected to the common terminal of a rotatable multiple pole odds switch, said poles being sequentially numbered; a plurality of rotatable miltiple pole secondary

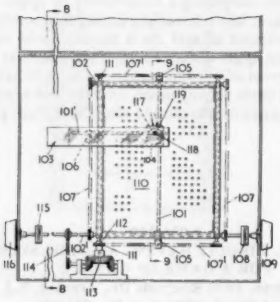
switches in sequential order starting from a first, said poles of said secondary switches being numbered; the common terminal of each of said secondary switches taken in sequence each being connected to a respective one of said sequentially numbered poles of said odds switch; and all of said secondary switches taken in reverse sequence save said first having at least one but fewer than all of its numbered poles removably connected to the common terminal of the preceding secondary switch, with said first secondary switch having at least one but less than all of its numbered terminals removably connected to the output of said electric circuit, said power source and win indicator being connected in series between said output and input of said circuit.

3,856,311

MACHINE FOR PUSHING PEGS OUT OF A GAME BOARD

Henry Francis Triggs, St. Albans, England, assignor to Remalo Engineering Company Limited, St. Albans, England

Filed Nov. 9, 1971, Ser. No. 197,082
Int. Cl. A63f 3/00
U.S. Cl. 273—139 **2 Claims**



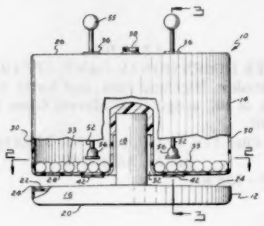
1. A machine for playing a game comprising a rectilinear board fixed in a vertical position, said board having front and rear sides and provided with a plurality of holes extending from the front side to the rear side in which holes pegs or spills can be inserted, a map positioned on the front side of the board for concealing the holes, a vertical rod located behind the rear side of the board, said vertical rod having upper and lower ends, a traveller fixed to each of said ends of the vertical rod, upper and lower horizontal rods on which said travellers are mounted for sliding movement, a pusher member, a pusher member bush for the pusher member, said bush being slidably mounted on said vertical rod, a cursor of transparent material solidly joined to the pusher member bush, a third horizontal rod solidly fixed to the pusher member bush and extending perpendicularly with respect to said first vertical rod, a vertically movable traveller in which said third horizontal rod slides, means operably related to said vertically movable traveller for moving said traveller vertically to shift said third horizontal rod vertically and carry therewith the pusher member bush and cursor with the pusher member bush sliding on the vertical rod, further means operably related to the travellers at the ends of the vertical rod for moving said travellers horizontally along the upper and lower horizontal rods whereby the pusher member bush and cursor move horizontally by means of the vertical rod, said cursor having a portion located in spaced relationship to the front side of the board, and means for engaging the pusher member with the rear side of the board so that the pusher member may be inserted into anyone of said holes to eject the peg or spill therefrom through the front side of the board.

3,856,312

MANUALLY ACTUATED BALL MIXING AND DISPENSING DEVICE

Stanley F. Dabrowski, 315 Arcadia Blvd., Springfield, Mass. 01118

Filed May 17, 1974, Ser. No. 470,955
Int. Cl. A63f 7/10
U.S. Cl. 273—144 A **7 Claims**



1. A device for mixing and dispensing indicia marked balls comprising a base member, a vertical post disposed in the middle of said base member, a covered ball retaining cup rotatably supported above said base member in spaced relation thereto on said vertical post, said cup having a ball feeding aperture in the cover thereof and at least one ball dispensing aperture in the bottom thereof, deformable ball retaining means covering each said ball dispensing aperture, and a manually actuated plunger means in said cup aligned with each said ball dispensing aperture and normally biased above said aperture a distance greater than the diameter of said balls for urging a ball from said cup past said deformable ball retaining means onto said base member.

3,856,313

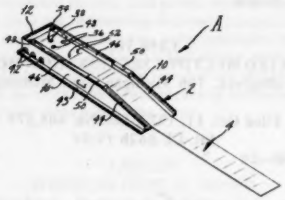
GOLF PUTTING APPARATUS WITH BALL RETURN

David P. Tierney, 1024 Forestwood Dr., Ferguson, Mo. 63135

Filed May 4, 1973, Ser. No. 357,166
Int. Cl. A63b 67/02
U.S. Cl. 273—176 FB **10 Claims**

1. A device for playing a game which simulates golf, said device comprising: a frame adapted to rest on a floor and having spaced apart sidewalls along its sides and also having a closed end and an open end, one of the sidewalls having at least one discharge opening therein which is sized to accommodate a golf ball; supporting means mounted on the frame between the sidewalls and defining a surface elevated above the floor level, the elevated surface being partly horizontal and partly inclined with the horizontal portion being at the closed end of the frame and the inclined portion being at the open end of the frame, the horizontal portion being spaced from the closed end of the frame a distance great enough to accommodate a golf ball so as to create a transverse slot at the closed end of the frame, the lower end of the inclined portion

being substantially at floor level, the supporting means having holes opening out of the horizontal portion of the elevated surface with the holes being sized to receive a golf ball; return means defining a return surface which is located beneath the holes in the supporting surface and below the transverse slot and is inclined upwardly from the discharge opening in said one sidewall to the other sidewall for receiving golf balls which enter the holes and slot and for directing them toward the discharge opening; gutters mounted on the frame above the



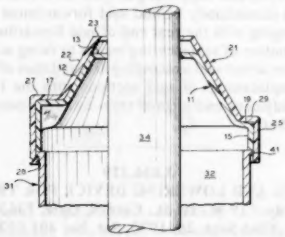
return surface and along the sides of the horizontal elevated surface of the supporting means, the gutters being inclined downwardly toward and opening onto the return surface of the return means so that golf balls which enter the gutters will be directed toward the discharge opening in said one sidewall; and a flexible mat supported in part on the horizontal and inclined portions of the supporting surface and extending out of the open end of the frame where the remainder of the mat is supported on the floor.

3,856,314

TWO-PIECE SHIELD

Ernest L. Smith, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 7, 1973, Ser. No. 395,031
Int. Cl. F16j *15/32*
U.S. Cl. 277—1 **11 Claims**



1. A shield suitable for covering the opening between a movable shaft and a surrounding housing, said shield comprising

a first resilient tapered shield member having a first opening at the narrow end thereof through which said shaft can pass, first annular means around its open large end adapted to contact the top surface of said housing, and a first slot extending from said first opening through said first annular means to said open large end to permit said first shield member to be engaged around said shaft without access to either end of said shaft; and

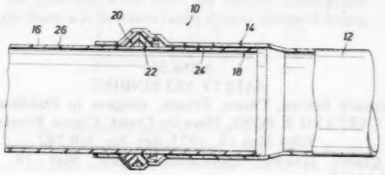
a second resilient tapered shield member having a second opening at the narrow end thereof through which said shaft can pass, second annular means around its open large end adapted to contact the outside surface of said housing, and a second slot extending from said second opening through said second annular means to said open large end of said second shield member to permit said second shield member to be engaged around said shaft without access to either end of said shaft, said second shield member being adapted to engage said first shield member along the outside surface of said first shield member and the inside surface of said second shield member with the slot in said first shield member being covered by the solid surface of said second shield member and the solid surface of said first shield member underlying the slot in said second shield member.

3,856,315

BELL AND SPIGOT PVC PIPE JOINT

Patrick H. Stansbury, N. 800 Fancher Way, Terminal Box 2706, Spokane, Wash. 99220

Filed Jan. 2, 1973, Ser. No. 320,282
Int. Cl. F16j *15/10*
U.S. Cl. 277—188 **20 Claims**



1. A pipe joint comprising:

a spigot at one end of a first section of PVC pipe;

a bell at one end of a second section of PVC pipe, said bell having a sufficiently large diameter to accommodate said spigot therein and having an annular recess formed therein;

an annular gasket seated in said annular recess and sealingly compressed between said bell and said spigot;

said gasket comprising a first portion formed of a first resilient material having a first hardness bonded to a second portion formed of a second resilient material having a second hardness less than said first hardness;

the cross-section of said first portion comprising a first linear segment, a second linear segment having one end intersecting one end of said first linear segment, a third linear segment longer than said second linear segment and having one end intersecting the other end of said first linear segment, and a fourth linear segment intersecting the other ends of said second and third linear segments; the cross-section of said second portion comprising said first linear segment, a fifth linear segment having one end intersecting said one end of said first linear segment, a concave curved segment having one end intersecting the other end of said fifth linear segment, a sixth linear segment having one end intersecting the other end of said curved segment, a seventh linear segment having one end intersecting said other end of said first linear segment, and a V-shaped segment intersecting the other ends of said sixth and seventh linear segments.

3,856,316

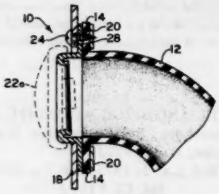
FUEL TANK FILLER NECK BREAKAWAY ASSEMBLY

Melvin C. Badberg, Lincoln, Nebr., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 4, 1972, Ser. No. 312,064
Int. Cl. B65d *39/00*
U.S. Cl. 280—5 A **7 Claims**

1. A breakaway fuel tank filler neck assembly adapted for attachment to the panel material of a vehicle body comprising: a. a flanged elastomeric filler neck hose having inner and outer flange surfaces; and

b. means providing a capped end closure and including compression bearing surfaces mounted and cooperating with said flange surfaces to effect a sealing engagement therewith and providing attachment of the hose flange to



the vehicle panel material such that the hose flange is in compression and to maintain the compression and sealing engagement should the filler neck assembly be disengaged from the vehicle panel material in a crash situation.

3,856,317

SAFETY SKI BINDING

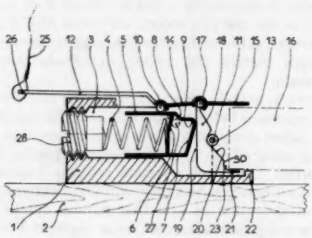
Bernard Sentou, Cluses, France, assignor to Etablissements CARPANO & PONS, Place du Cretet, Cluses, France

Filed May 16, 1973, Ser. No. 360,782

Claims priority, application France, May 19, 1972, 72.18018

Int. Cl. A63c *9/00*

U.S. Cl. 280—11.35 T **7 Claims**



1. Ski safety heel binding, comprising a frame including means defining a plane face adapted to be fitted on the upper surface of a ski with a principal axis of said frame disposed along the longitudinal axis of the ski, guide means fixed relative to said frame, a boot sole holding member pivotally mounted on said frame about a first axis parallel to said plane face and perpendicular to said principal axis, a lever pivotally mounted on said member about a second axis parallel to and spaced apart from said first axis, said lever having opposed first and second faces, a piece movably mounted on said frame, means defining a first profiled surface on said piece, elastic means for urging said piece against said first face of said lever to apply said second face of said lever against said guide means said second surface of said lever having means defining a cam-like profile for cooperating with said guide means to hold said member down in a first boot-sole engaging position under the action of said elastic means while allowing movement of said member to a second boot-sole releasing position when said member is subjected to a raising force exceeding a given valve; and release means for enabling voluntary movement of said member to its second position, said release means including a second lever pivotally mounted on said frame about a third axis parallel to said second axis, said second lever including a part which engages with play with said movable piece, said second lever including means for enabling it to be manually moved from a first position to a second position, said part cooperating with said means defining a first profiled surface of said piece for moving said piece against the action of said elastic means from a first position acting against said first surface of said first lever to a second position removed from said first surface of said first lever when said second lever is moved from its first to its second position, profiled stop means on said frame, and means for defining a second profiled surface on said piece for engaging with said profiled stop means on said frame for releasably holding said piece in said second position under the action of said elastic means.

3,856,318

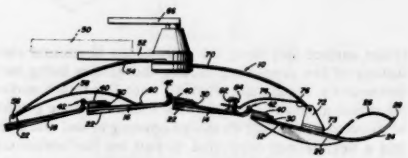
ARTICULATED MULTIPLE SECTION SNOWMOBILE SKI

Perry T. Hollenbeck, 706 Michigan Ave., Manistique, Mich. 49854

Filed Oct. 11, 1973, Ser. No. 405,579

Int. Cl. B62b *19/04*

U.S. Cl. 280—28 **10 Claims**



1. An elongated ski assembly including front and rear ends and defined by at least three elongated and end aligned ski sections having adjacent ends pivotally joined together for relative angular displacement about horizontal transverse and upstanding axes, a support member, spring means supporting said sections from said support member for vertical shifting relative thereto and including steering means connected to at least the forwardmost section for swinging the latter about an upstanding axis disposed rearward of said forward section relative to said support, said spring means, including said steering means, also supporting at least the forward end of the ski section immediately behind said forwardmost section for lateral swinging with the rear end of said forwardmost section during actuation of said steering means to swing said forwardmost section about said upstanding axis and thus allow relative angular displacement of said sections with the latter maintained in adjacent end aligned train fashion position relative to each other.

3,856,319

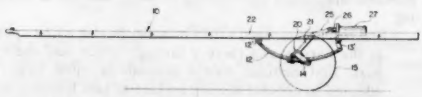
LIFTING AND LOWERING DEVICE FOR TRAILERS

Clyde Hardy, 119 W. 1st St., Cordell, Okla. 73632

Filed Sept. 26, 1973, Ser. No. 401,022

Int. Cl. B62d *33/08*

U.S. Cl. 280—43.18 **3 Claims**



1. A trailer having a front and rear end with side rails forming a bed adapted for travel over the road and having a front hitch and at least two wheels disposed toward the rear of the bed to support the load carrying bed comprising a pair of elongated leaf spring means connected between the wheels and bed, one each of said spring means being disposed to extend longitudinally along each of the opposite sides of the trailer respectively and being pivotally connected to the trailer at the front end and connected to the trailer by means of an articulating link at its rear end, a main axle rotatably carried

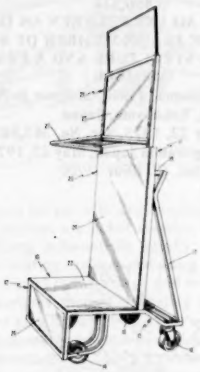
in bearings fixed to said spring means, crank arms at the ends of the main axle, stub shafts at the ends of said crank arms upon which said wheels are mounted, a lever fixed to one end of said axle to rotate the axle in said bearings, said lever being of a length to extend from said axle to the underside of one of said side rails whereby said crank arms are rotated with the axle supported on the bearings on said springs to turn on the stub shafts in the wheels to raise and lower the axle and the associated spring means and bed relative to the road, reciprocably driven power means connected to said lever with a link pivotally connected thereto, and power drive means mounted on the bed over the articulating link that connects the spring to the bed and said construction being operative to lower the bed relative to the ground when said driven power means is extended and to lift said bed for travel when said power means is retracted, to relieve the power means of undue load stresses when the trailer travels over the road.

3,856,320

WHEELED DISPLAY STAND

Horace Blanchard, Hasbrouck Heights, N.J., assignor to Nabisco, Inc., New York, N.Y.

Filed May 21, 1973, Ser. No. 362,177
Int. Cl. B62b *3/00*
U.S. Cl. 280—47.35 **9 Claims**



1. A wheeled display stand comprising in combination a product supporting base having front and rear edges, a product retaining back extending upwardly from the rear edge of said base, a front panel extending downwardly from the front edge of said base, a rear extension member extending rearwardly from each side of said base substantially past the most rearward portion of said back, a pair of wheels adjacent the bottom of said front panel beneath said base, a pair of castered wheels mounted to said extension members and positioned adjacent the outer end thereof, and a reinforcing member inclined from the vertical toward said back and extending from adjacent the outer end of each of said extension members upwardly to said back, a handle member extending between said reinforcing members, said product retaining back comprising a lower product retaining section rigidly secured to said base, an upper product retaining section including an upper back section telescopically mounted to said lower section to vary the height of said back, locking means for holding said upper back section in a selection position, means on said upper back section for supporting a shelf, and a shelf mounted to said upper back section by means of said shelf supporting means.

3,856,321

WHEELED BOARD TOY ASSEMBLY

Frank Solymosi, 255 Violet St., Massapequa Park, N.Y. 11762

Filed Oct. 20, 1972, Ser. No. 299,432
Int. Cl. A63c *17/00*
U.S. Cl. 280—87.04 **20 Claims**

1. A skiing instruction device comprising:

a. a pair of elongated platforms each having an upper surface adapted to receive a different foot of the user when the foot is disposed along the length of the platform;

b. a pair of wheel assemblies each having at least one wheel mounted spaced apart with respect to one another along the lower surface of each of the pair of platforms, the axis of rotation of each wheel extending substantially in a transverse direction with respect to the length of the platform, the wheel assemblies enabling the platforms to travel along a rolling surface in the direction of the length of the platforms when the user is standing thereon;

c. means flexibly coupled to the leading portion of each of the platforms for maintaining the leading portions at a predetermined distance with respect to one another to enable the platforms to travel together in a side-by-side relationship when the user is standing thereon and for enabling the platforms to be rotated about an axis substantially parallel to the longitudinal axis of the platforms whereby the user utilizes the platforms to simulate the techniques of snow skiing; and

d. means flexibly coupled to the trailing portion of each of the platforms for maintaining the trailing portions at a predetermined distance with respect to one another to enable the platforms to travel together in a side-by-side relationship.

3,856,322

MOBILE PACKAGING AND STACKING DEVICES

Ute W. Bestehorn, 3330 Morrison Ave., Cincinnati, Ohio 45220

Division of Ser. No. 37,786, May 15, 1970, Pat. No. 3,712,463. This application May 31, 1972, Ser. No. 258,329
Int. Cl. B62d *53/06*
U.S. Cl. 280—79.1 **6 Claims**

1. A mobile packaging, stacking, and display device for materials adapted to be stacked comprising:

a base plate for supporting said materials on said base plate having spaced elongated side slots parallel and adjacent sides of said base plate and other spaced elongated end slots adjacent to ends of said base plate,

a continuous side band of flexible self-spiraling material extending down around a side and upwardly through one of said side slots and across the top of said base plate to span a space between the side slots and extending down through the other of said side slots and up and around the other of said sides of said base plate, and equal lengths of

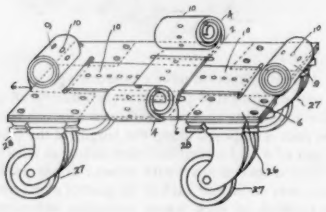
said side band retained on each of the sides of said base plate,

another continuous end band of self-spiraling material extending down around an end of said base plate and upwardly through one of the said elongated end slots and across the top of said base plate to span a space between the said end slots and extending down through the other of said end slots and up around the other side of said base plate, and equal lengths of said end band retained on each side of said base plate,

said base plate having a hole centrally located and peripheral holes centrally located adjacent the sides of said base plate for securing said bands to said base plate,

a multiple of spaced holes throughout the length of said bands and selected holes in said bands adapted to be indexed with said hole in said base plate, a removable fastener securing said bands at right angles to each other on said base plate through said selected holes and said hole in said base plate,

said bands adapted to be removably wrapped around said stack of materials to secure said stack in a bundle,



removable fasteners to secure said bands in tightly wrapped condition around said stack to provide a rigid bundle of materials,

a multiple of casters removably secured to said base plate, said casters having a multiple of button headed studs extending upwardly from head plates of said casters,

said button head studs having shanks smaller in diameter than said button heads thereby providing a space intermediate a bottom of said buttons and said head plate,

a multiple of U-slots adjacent to corners of said base plate, said U-slots having first legs perpencidular to bottom slots forming said U-slots and terminating in orifices sufficiently enlarged to receive said button heads and said slots being narrower than said orifice for said button heads to slidably retain said shanks of said button head studs,

other leg slots of said U-slots disposed at acute angles to said bottom slots and directed toward said first leg slots thereby forming continuous U-slots, and;

a depression at the end of each said angularly displaced other leg slot adapted to removably retain said button head and secure said caster from movement in relation to said base plate.

3,856,323

MOTOR VEHICLE CHASSIS SUBASSEMBLY

Klaus H. Arning, Birmingham, and Robert J. Rumpf, Grosse Pointe, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 52,235, July 6, 1970. This application Sept. 1, 1972, Ser. No. 285,690

Int. Cl. B60t *13/00*

U.S. Cl. 280—96.2 R **5 Claims**

1. A motor vehicle chassis subassembly comprising a frame component and front wheel support means,

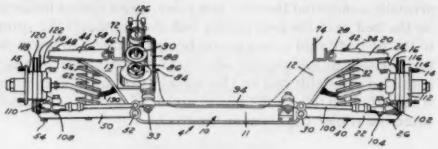
suspension means interconnecting said wheel support means and said frame component,

said suspension means being constructed to resiliently support said wheel support means for jounce and rebound movement relative to said frame component,

hydraulic brake actuating means secured to said frame component,

wheel brake means secured to said wheel support means,

hydraulic conduit means interconnecting said brake actuating means and said wheel brake means,



mounting means secured to said frame component and constructed to connect said subassembly including said frame component, said wheel support means, said suspension means, said hydraulic brake actuating means and said wheel brake means as a unit to the chassis of a motor vehicle.

3,856,324

CONNECTING MEANS BETWEEN AN IMPACT ABSORBING SIDE FRAME MEMBER OF A MOTOR VEHICLE FRAME STRUCTURE AND A TRANSVERSE MEMBER

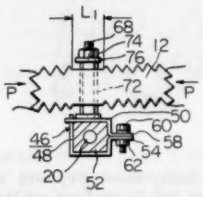
Shigeru Saitoh, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 22, 1973, Ser. No. 362,842

Claims priority, application Japan, May 23, 1972, 47-60182

Int. Cl. B60r *19/00*

U.S. Cl. 280—106 R **6 Claims**



1. A frame structure for use in a motor vehicle having an occupant compartment including a pair of longitudinal side frame members extending in a longitudinal direction of said vehicle, and a transverse member located substantially transversely to said longitudinal direction of said vehicle, comprising a mounting unit for connecting said transverse member to each of said side frame members which unit supports said transverse member and which unit has at least one rod, said mounting unit being mounted on the corresponding side frame member through said rod, wherein said rod of said mounting unit comprises a single rod, each of said side frame members is formed in opposite surfaces thereof with a hole for receiving said single rod, and wherein each of said side frame members is provided with a tube for inserting said rod thereinto, said tube being received in said holes and being securely fixed to said side frame member.

3,856,325

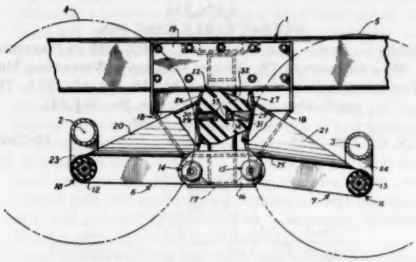
MULTIPLE AXLE VEHICLE SUSPENSION SYSTEM

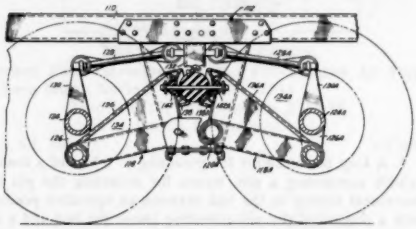
Elwood H. Willetts, 102 S. Penataquit Ave., Bay Shore, N.Y. 11706

Division of Ser. No. 293,648, Sept. 29, 1972, abandoned, which is a continuation-in-part of Ser. No. 196,982, Nov. 9, 1971,. This application Aug. 23, 1973, Ser. No. 390,931

Int. Cl. B60c 5/06

U.S. Cl. 280—124 R 9 Claims





1. A structure for use with axle suspension system, comprising, in combination: a bracket member formed with bearing surfaces defining substantially axially aligned holes therethrough, said bearing surfaces extending substantially longitudinally with respect to the axis of said holes, a tubular assembly having portions thereof extending through said aligned holes, tapered plug members disposed within end portions of said tubular assembly and each being formed with an opening extending therethrough, and threaded means extending through said openings for moving said plug members toward one another, thereby firmly holding said tubular assembly end portions against said bearing surfaces, said tubular assembly comprises at least one split tube member, a sleeve member disposed in contact with and disposed between said split tube member and an elastomeric member, said elastomeric member encircling portions of said sleeve, and a ring member disposed in contact with and encircling portions of said elastomeric member.

3,856,326

OCCUPANT RESTRAINT SYSTEM

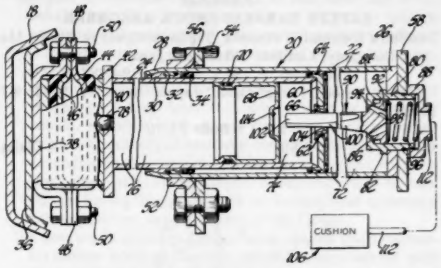
Brook A. Lindbert, Utica; Wesley L. McCollum, Brighton, and Edward H. Mertz, Birmingham, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 24, 1972, Ser. No. 309,458

Int. Cl. B60r 21/08

U.S. Cl. 280—150 AB 4 Claims

1. In an automotive vehicle, the combination comprising, an inflatable occupant restraint mounted within an occupant compartment of the vehicle, a bumper impact bar, energy absorbing means supporting the impact bar on the vehicle and including a piston movable within a chamber containing a gas liquefied under pressure and ambient temperature, means controlling the displacement of the liquefied gas from one side of the piston to the other side of the piston upon impact of the impact bar with an obstacle to absorb the energy of the resultant impact forces, and means responsive to the displacement



of a predetermined volume of liquefied gas to the other side of the piston for communicating the chamber and the restraint to release the liquefied gas for expansion and flow to the restraint for inflation thereof.

3,856,327

SAFETY SEAT BELT FOR MOTOR VEHICLE

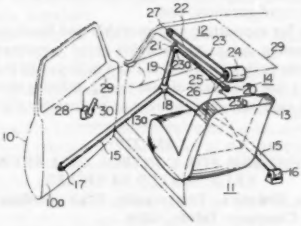
Syuichi Otani, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 3, 1972, Ser. No. 231,586

Claims priority, application Japan, Mar. 11, 1971, 46-15942

Int. Cl. B60r 21/02

U.S. Cl. 280—150 SB 3 Claims



1. A safety seat belt for a motor vehicle having a door provided with the inner panel and with a door handle, a floor panel, a seat with a seat portion and on up-right backrest portion mounted on the floor panel and a ceiling structure, and adapted to restrain a passenger from injury in the event the motor vehicle undergoes an excessive deceleration comprising, in combination, a lap belt having one end connected to said floor panel by means of an inertia-responsive retracting means and the other end connected to the inner panel of said door, said lap belt extending over and across the seat portion of said seat, a shoulder belt having one end connected to an intermediate portion of said lap belt and the other end secured to an outboard portion of said ceiling structure approximately over said upright backrest portion, an electric actuation mounted on said ceiling structure adjacent said other end of the shoulder belt, a driving member connected to said electric actuator, a driven member mounted on said outboard portion forwardly of said driving member, an endless means provided between said driving and driven members and having straight portions movable back and forth substantially parallel to the plane of said ceiling structure, a guide ring fixedly connected to said endless means and slidably receiving therein said shoulder belt, and an electric switch mounted on said door at the door handle thereof and opened and closed by said door handle, said electric switch being electrically connected to said electric actuator, whereby, when said electric switch is closed, said electric actuator is actuated to move said endless

means to cause said guide ring to raise said shoulder belt away from the seat portion.

3,856,328

SAFETY HARNESS SHOCK ABSORBER

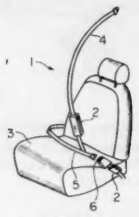
Toshihiro Koizumi, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sept. 7, 1973, Ser. No. 394,987

Claims priority, application Japan, Sept. 9, 1972, 47-105315

Int. Cl. B60r *21/10*

U.S. Cl. 280—150 SB **4 Claims**



1. In a vehicle having a safety harness having at least one of a shoulder strap and a seat belt extending over a portion of a seat for restrining a vehicle occupant in the event of an excessive deceleration condition of the vehicle, a shock absorber for absorbing kinetic energy from the occupant caused by the excessive deceleration which comprises:

movable and fixed pulleys about which said at least one of a shoulder strap and a seat belt extends in a block and tackle configuration; and

a casing for supporting said movable and fixed pulleys and comprising means to yieldably resist movement of said movable pulley toward said fixed pulley, said means comprising side members of said casing defining slots through which said movable pulley may be forcibly moved.

3,856,329

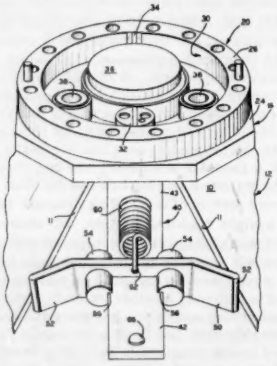
SENSING ARM FOR CONTROL UNIT BETWEEN ARTICULATED VEHICLES

Miguel A. Ordorica, Temperance, Mich., assignor to The Mather Company, Toledo, Ohio

Filed Oct. 24, 1973, Ser. No. 409,058

Int. Cl. B62d *53/08*

U.S. Cl. 280—432 **11 Claims**



1. In an articulated connection between two vehicles having a king pin mounted on one vehicle that fits into a "V" shaped notch in the fifth wheel mounted on the other vehicle, and having a control unit attached to said king pin for damping relative angular movement between two said vehicles, the improvement in a sensing means attached to said king pin and fitting in said notch said sensing means comprising:

A. a radially extending arm fixedly attached to said king pin,

B. a cross member slidable along said arm, the ends of which cross member are engageable with the edges of said "V" shaped notch, and

C. spring means acting on said cross member for urging said cross member towards said king pin.

3,856,330

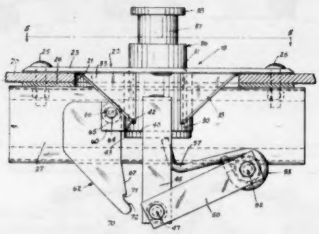
RETRACTABLE KING PIN

Bobby G. Baxter, and Theodore B. Splitt, both of Warrenton, Mo., assignors to The Binkley Company, Warrenton, Mo.

Continuation-in-part of Ser. No. 322,640, Jan. 11, 1973,. This application Aug. 24, 1973, Ser. No. 391,041

Int. Cl. B62d *53/08*

U.S. Cl. 280—433 **12 Claims**



1. A king pin assembly for mounting to a bed of a towing vehicle comprising a pin, means for mounting the pin for movement normal to the bed between an operative position with a portion of the pin extending above the bed and a retracted position with the pin depressed, spring means for biasing the pin in its oerative position, quick release locking means for releasably locking the pin in its retracted position, and means for operating the quick release locking means from the upper side of the vehicle bed for releasing the pin from its retracted position to its operative position.

3,856,331

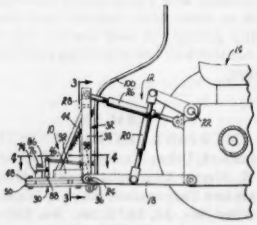
HITCH

Nick Bogdanovich, 5051 12th Ave., Hanford, Calif. 93230

Filed Oct. 31, 1973, Ser. No. 411,257

Int. Cl. B60d *1/04*

U.S. Cl. 280—479 R **1 Claim**



1. An improved hitch for coupling a towable vehicle with a towing vehicle comprising:

A. a hitch-pin receiver including a pair of horizontally oriented plates disposed in mutually spaced parallelism, each of said plates being provided with a pair of converging surfaces defining a horizontally extended throat for receiving a hitch pin;

B. a latching pawl comprising a substantially disk-shaped plate interposed between said horizontally oriented plates including a pair of surfaces defining therefor a peripheral fluke, means supporting said latching pawl for oscillatory motion including a bearing pin extended through said pair of horizontally oriented plates in abaxial alignment with said throat, tension means connected with said pawl for continuously urging said pawl in displacement toward a first position wherein the fluke is in juxtaposition with said throat and one surface of said pair of surfaces defining said fluke is disposed substantially transversely of said throat in a position to be engaged by a hitch pin as the hitch pin is inserted into said throat for displacing said pawl to a second position wherein the fluke is disposed transversely of said throat for capturing said hitch pin;

C. a pawl retainer for securing said pawl against angular displacement, including a spring-biased locking pin supported for extension through at least one of said horizontally oriented plates and said pawl;

D. release means for extracting said lockiing pin from said pawl comprising a bellcrank having one arm therof connected with said spring-biased locking pin and the opposite arm thereof connected with a manually operable linkage; and

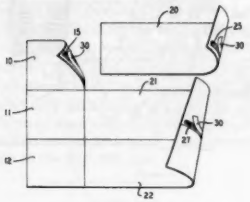
E. means for connecting said hitch with a three-point hitch assembly of a tractor.

3,856,332

REATTACHABLE CHECKS

Herbert Elmer Snedeker, P.O. Box 4397, Patrick Air Force Base, Indian Harbour Beach, Fla. 32925

Filed Feb. 20, 1973, Ser. No. 333,638
Int. Cl. B42d *15/00*
U.S. Cl. 283—57 **1 Claim**



1. A checkbook page comprising a plurality of stubs, a plurality of checks individually detachable from said stubs and from each other in conventional manner, individual adhesive surfaces disposed on each said stub along the edge to which the check associated therewith is attached, an adhesive surface disposed on at least one of each adjacent two of said checks along substantially the entire edge attaching said adjacent two checks together, said adhesive surfaces disposed for reattaching detached ones of said checks to each other and to said stubs in an overlapping relationship in substantially their original locations, and removable protective material normally covering said adhesive surfaces.

3,856,333

DRIP IRRIGATOR DEVICE

Edwin Dexter Cox, Pine, Colo., assignor to Johns-Manville Corporation, Greenwood Village, Colo.

Filed Dec. 7, 1972, Ser. No. 313,064
Int. Cl. F16l *55/00;* **E02b** *13/00*
U.S. Cl. 285—14 **2 Claims**

1. An irrigation dripper unit to connect adjacent pipeline sections comprising:

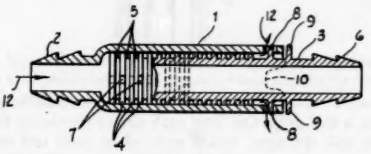
an outer tubular member;

an inner tubular member fitting within said outer tubular member;

one pair of opposite end portions of said inner and outer tubular members projecting beyond the other pair of opposite end portions of said outer and inner tubular members respectively, for connection to adjacent pipeline sections;

a series of radial flanges axially spaced apart and attached to and projecting from the outer surface of said inner tubular member, each of said flanges extending circumferentially entirely around said inner tubular member and extending to substantially fill the annular space between said inner and outer tubular members, each of said flanges having therein a notch permitting fluid communication between opposite sides of the flange;

the notches in adjacent flanges being spaced apart circumferentially whereby there is defined a labyrinthine path for irrigation fluid passing from one end of said series of



flanges axially along said inner tubular member to the other end of said inner tubular member, said labyrinthine path being radially bounded by the inner surface of said outer tubular member and the outer surface of said inner tubular member;

a groove between each pair of adjacent radial flanges, wherein each groove has therein a barrier which completely blocks said groove and the notches in the adjacent pair of radial flanges being adjacent to, but spaced on opposite sides of said barrier, each of said grooves extending circumferentially around said inner tubular member from one side of said barrier to the other side of said barrier, thereby defining a fluid path which essentially encircles said inner tubular member;

one end of said labyrinthine path communicating with an adjacent pipe section and defining an inlet;

an outlet in said unit adjacent to and communicating with the opposite end of said labyrinthine path; and

connecting means formed in said unit for releasably connecting said tubular members together.

3,856,334

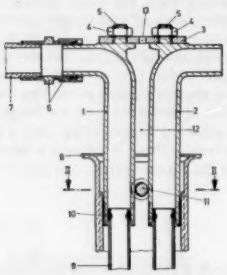
APPARATUS FOR ATTACHING A HOT AND COLD WATER PLUMBING FIXTURE TO BUILDING WATER PIPES

Hermann Paul Lange, Singlistrasse 15, 8049 Zurich, Switzerland

Filed Nov. 24, 1971, Ser. No. 201,848
Claims priority, application Austria, Dec. 2, 1970, 10849/70
Int. Cl. F16l *39/04*
U.S. Cl. 285—137 R **2 Claims**

1. Apparatus for attaching a hot and cold water plumbing fixture having a housing enclosing a pair of spaced water supply lines disposed substantially parallel to each other to hot and cold water pipes installed in a building, said apparatus comprising a wall fitting including a pair of connecting pipes which are arranged parallel to each other adjacent one end and adapted to be connected respectively to the building water pipes at their opposite ends, said opposite ends of said pipes extending at a substantial angle one to the other, the parallel portions of said connecting pipes being of such size and spacing as to receive and telescope with the spaced parallel fixture water supply lines, means holding said connecting

pipes together with the parallel end portions spaced a fixed distance apart and permitting rotation of said connecting pipes about an axis through said parallel end portions in order to change the disposition of said opposite ends, said means for holding and permitting rotation includes a plate coextensive with a portion of the length of said connecting pipes at said opposite ends, said plate providing a pair of spaced apertures, each of said connecting pipes at said opposite end having a



surface complementary to for receipt in juxtaposition on said plate, a stud projecting from each surface for receipt through each said apertures, means received by each said stud for fastening said connecting pipes to said plate, sealing means for making water-tight the joint between said connecting pipes and fixture supply lines when they are telescoped together, and means for mechanically locking said fixture housing and said wall fitting together when said connecting pipes and supply lines are in telescoped engagement.

3,856,335

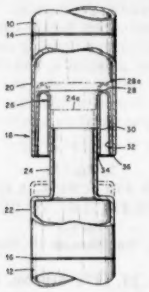
ROLLING DIAPHRAGM SLIP JOINT

Alexander Blake, 550 Escondido Cir., Livermore, Calif. 94550

Filed Nov. 16, 1973, Ser. No. 416,554

Int. Cl. F16l *13/02*

U.S. Cl. 285—286 **1 Claim**



1. A shock-absorbing fluid-tight slip joint for attenuating the transmission of axial compressive shock loads from one bore hole casing member to another, said slip joint having:

a first collar member continuously welded at one end to one of said casing members and coaxial therewith;

a second collar member continuously welded at one end to the other of said casing members and coaxial therewith, said second collar member having an extension of reduced size extending into said first collar member, concentrically therewith and defining an annular clearance therebetween;

a generally annular diaphragm extending between said collar members and coaxial therewith, said diaphragm having a generally semi-toroidal convolution with inner and outer concentric sleeves integral therewith and extending therefrom, the inner sleeve at its end distal to said convolution being continuously welded to a mid-region of said extension of said second collar member, and the outer sleeve at its end distal to said convolution being continuously welded to the other end of said second collar member, said diaphragm being disposed generally within said annular clearance and substantially free of contact with said collar members except where welded thereto, whereby to accommodate minor misalignment of said casing members, said diaphragm being stiff and made of relatively thick but ductile material, plastically deformable by the rolling of said convolution upon the application of severe axial compressive shock to one of said casing members, whereby to absorb energy from said shock and mitigate its transmission along said casing, yet permit the pulling of said casing members from said bore hole without permanent elongation of said joint.

3,856,336

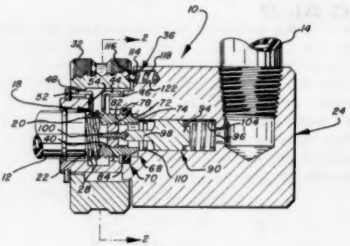
COUPLING ASSEMBLY

Thomas D. Karcher, Rocky River, and Walter W. Antoniw, Lakewood, both of Ohio, assignors to The Hansen Manufacturing Company, Cleveland, Ohio

Filed Feb. 7, 1973, Ser. No. 330,395

Int. Cl. F16l *37/22*

U.S. Cl. 285—316 **8 Claims**

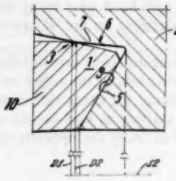


1. A quick-connect coupling assembly for use in connecting first and second conduits in fluid communication, said coupling assembly comprising a plug member adapted to be connected with the first conduit, said plug member including outer surface means defining an external helix having a plurality of turns extending in a continuous path around said plug member, socket means adapted to be connected with the second conduit, said socket means including means defining chamber for receiving said plug member, coil spring means connected with said socket means for applying a radially inwardly directed force to said plug member along a plurality of turns of said helix to resiliently grip said plug member and hold said plug member in said chamber, said coil spring means including a resiliently deflectable coil spring having a plurality of turns of the same pitch as said external helix and a free internal diameter which is less than the root diameter of said helix, and means for resiliently flexing each of the plurality of turns of said coil spring to a simultaneously increase the internal diameter of each of said plurality of turns of said coil spring to a diameter which is greater than the crest diameter of said helix to facilitate rapid connection and disconnection of said coupling assembly.

3,856,337
PIPE COUPLING

Karl Horst Ehm, Mulheim; Paul Schatton, Dusseldorf, and Joachim Kruse, Meerbusch, all of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed July 6, 1972, Ser. No. 269,336
Claims priority, application Germany, July 9, 1971, 2134274
Int. Cl. F16l *25/00*
U.S. Cl. 285—334 **3 Claims**



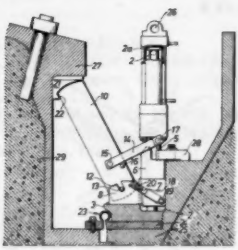
1. In a pipe coupling structure as between first and second pipes with tapered external and internal threading, respectively, of the first and second pipe to be threadedly interconnected upon threading the first pipe into the said second pipe in a particular axial direction, each pipe having an axis, the improvement comprising, an unthreaded end portion of the first pipe with the external threading, having an annular, radially outwardly directed first convexity, having a first crest, the first crest having particular diameter relative to the axis of the first pipe, and in a plane transverse thereto, the outer diameter of the unthreaded portion of the first pipe gradually decreasing from the first crest in the axial direction of insertion of the first pipe, the second pipe having internally an unthreaded portion, beyond the internal thread and in axial direction into the pipe; the unthreaded portion of the second pipe having an annular, radially inwardly directed second convexity having a second crest of a diameter, relative to the axis of the second pipe slightly smaller than said particular diameter of the first crest, the inner diameter of the unthreaded portion of the second pipe gradually decreasing towards the second crest in the axial direction of insertion of the second pipe, the first and second convexities sealingly engage upon threaded insertion of the first pipe in the second pipe.

3,856,338
LOCKING DEVICE FOR THE LID OF A PRESSURE VESSEL

Erik Borje Johnsson, Trosa, Sweden, assignor to Aktiebolaget Atomenergi, Stockholm, Sweden

Filed Apr. 18, 1973, Ser. No. 352,224
Claims priority, application Sweden, May 26, 1972, 6988/72
Int. Cl. B65d *45/00*
U.S. Cl. 292—256 **10 Claims**

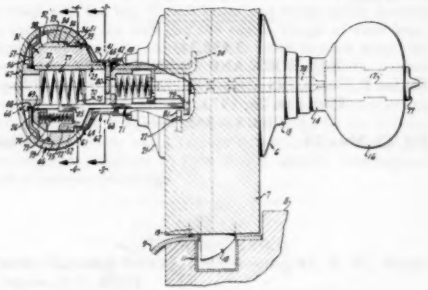
1. Locking device for the lid of a pressure vessel, comprising a plurality of support legs (**10**) arranged along the circumference of the lid (**25**), a shoulder (**25***a*) on the lid for the lower end of the support legs and a shoulder (**27**) on the pressure vessel (**28**) for the upper end of the support legs, characterised in that the lower end of the support leg is pivotably fitted on a support plate (**8**), that the support plate (**8**) is movable perpendicularly to the circumference of the lid, that a hydraulically or pneumatically driven slide (**4**) is arranged to be movable substantially vertically close to the support leg (**10**), that the slide (**4**) is connected by means of a link arm to the support leg (**10**) in order to pivot this to engage or disengage with the shoulder (**27**) on the pressure vessel, that by means of a spring load link arm (**18**) the slide is connected to the support plate (**8**) to move the support plate perpendicularly outwards towards the circumference of the lid to tighten up the support leg and to permit a wedge (**7**) to be applied against the support plate, and that the wedge (**7**) is arranged to be moved by the slide (**4**) into engagement with the support plate (**8**) to force this into a position where the support leg (**10**) is tightly clamped between the pressure vessel and the lid and to lock the support plate in this position.



3,856,339
RELEASABLE KNOB FOR A LOCK

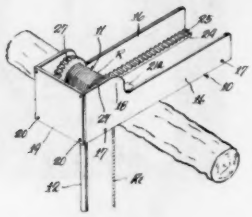
John A. Tornoe, Redwood City, and Curtis A. Dyer, Belvedere, both of Calif., assignors to Schlage Lock Company, San Francisco, Calif.

Filed Apr. 9, 1973, Ser. No. 349,241
Int. Cl. E05c *1/00*
U.S. Cl. 292—336.3 **11 Claims**



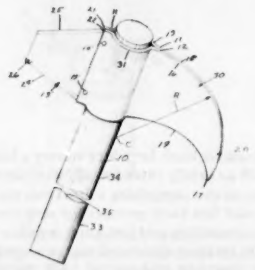
1. A releasable knob for a lock having a body and having a spindle with an axially extending slot rotatable relative to said body about an axis comprising a first knob member, means for mounting said first knob member for rotation about said axis, means for connecting said first knob member and said spindle for conjoint rotation about said axis, a second knob member, means for mounting said second knob member around said first knob member for rotation relative thereto about said axis, means forming an axially extending first groove in one of said knob members, means forming an axially extending second groove in the other of said knob members adapted in one relatively rotated position of said knob members to be in axial alignment with said first groove, a locking bar, means for mounting said locking bar in said spindle slot for movement in an axial direction between one position disengnaged from one of said grooves and a second position in engagement with both of said grooves.

3,856,340
ROPE DROPS
Robert W. Faulkner, 8296 Park Ave., Garrettsville, Ohio 44231
Filed Nov. 21, 1973, Ser. No. 418,072
Int. Cl. A47f 13/06
U.S. Cl. 294—19 R **7 Claims**



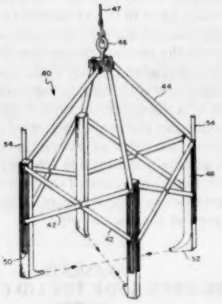
1. A rope drop, comprising:
a spool, having rope wound thereon,
a cradle, having elongated track means, said cradle releasably supporting said spool at one end of said track means, support means operated by a person at ground level for elevating said cradle and the spool supported thereby to a position above an object over which the rope is to be dropped, with said one end of said track means disposed on one side of said object and the opposite end of said track means disposed on the opposite side of said object, a free end of said rope extending from the part wound on said spool and extending downwardly on said one side of said object,
whereby a pull on said rope free end propels said spool along said track means to cause it to drop off the latter and fall toward the ground, said spool unwinding rope as it falls.

3,856,341
HAY HOOK AND TWINE CUTTER
Florian F. Florek, 126 Marker St., Edinboro, Pa. 16412*
Filed Feb. 26, 1973, Ser. No. 336,019
Int. Cl. B65g 7/12
U.S. Cl. 294—24 **1 Claim**



1. A hay hook and twine cutter combination comprising
a handle,
a first plate and a second plate,
and a cutter,
said first plate and said second plate each having a flat hook part, a flat cutter receiving part, and a curved handle engaging part between said hook part and said cutter receiving part,
said handle engaging parts of said plates curving outwardly from each other and providing a space for a handle therebetween,
said cutter receiving parts receiving an edge of said cutter therebetween and fastening means holding said cutter to said cutter receiving parts,
said cutter having two sharpened edges extending from said cutter receiving parts and diverging toward each other,
an end of said handle being received between said handle engaging parts of said plates and said hook curving toward said handle,
and means holding said hook parts of said plates together, the outside of said hook part being defined by a curved outer surface defining an arc of approximately 90° of a circle,
said arc terminating adjacent said handle at one end and at the point of said hook at the other end,
a second arc defining the other side of said hook,
said second arc starting at said handle and terminating at said point and defining the opposite side of said hook.

3,856,342
PANTOGRAPHIC CARGO HOIST
James M. Kelly, 15 Bailey Ave., Beverly, Mass. 01915
Filed May 14, 1973, Ser. No. 360,141
Int. Cl. B66c 1/16
U.S. Cl. 294—67 R **21 Claims**



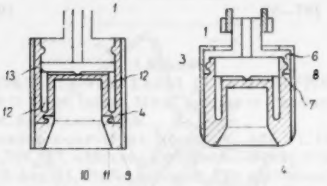
1. A hoisting apparatus which comprises in combination:
a clamping mechanism having a plurality of uniformly dimensioned planar walls, each of said planar walls including at least two sides of a pantograph, the entire clamping mechanism including a plurality of interconnected pantographs, at least two of said pantographs having a common corner, the pantographs each comprised of members pivotally connected such that the movement of any one of the members of any pantograph will effect a corresponding movement in all of the members of all of the other pantographs of the clamping mechanism defining the sides, and
means to retract all of the planar walls of the structure to a release position, whereby the cross-sectional area defined by the planar walls is uniformly increased and to elongate the planar walls to a clamping position, whereby the cross-sectional area is uniformly diminished, and the walls may engage a load to be moved.

3,856,343

BOTTLE GRIPPER FOR PACKING AND UNPACKING MACHINES

Friedhelm Muller, Dortmund-Wickede, Germany, assignor to Holstein & Kappert Maschinenfabrik "Phonix" GmbH, Dortmund, Germany

Filed Dec. 6, 1972, Ser. No. 312,732
Int. Cl. B66c 1/46
U.S. Cl. 294—99 R 5 Claims



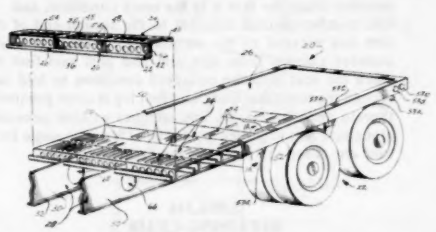
1. A bottle gripper for use in packing and unpacking machines, comprising a vertically extending double collar including a vertically extending annular inner elastic wall and a vertically extending annular outer elastic wall spaced radially outwardly from and laterally enclosing said inner wall, said inner wall and outer wall being integrally connected together at their lower ends, a separate horizontally arranged connecting piece disposed horizontally and extending across the upper end of said outer wall and disposed in surface contact with said outer wall, said double collar includes a horizontally arranged section integrally formed with and extending across the upper end of said inner wall for forming a seal for forming a sealed closure for the upper end of the space laterally enclosed by said inner wall, the combination of said inner wall and said horizontally arranged section thereof along with said outer wall and connecting piece forming a closed space within said double collar which can be charged with a pressure medium and said connecting piece arranged to provide a passageway for supplying the pressure medium into the closed space, wherein the improvement comprises that said horizontally arranged section integrally formed with said inner wall is spaced below and separate from said connecting piece, said outer wall has a circumferentially extending annular bead located adjacent to and spaced below its upper end, said connecting piece has an annular groove formed therein spaced intermediate its upper and lower horizontal surfaces and extending in the circumferential direction thereof and disposed in juxtaposition to said annular bead on said outer wall so that said annular bead seats within said annular groove, and an elastic sleeve tightly laterally encloses the radially outer surface of said outer wall and provides an inelastic support for the engagement of said annular bead in said annular groove, the radially inner surface of said inelastic sleeve located below the upper horizontal surface of said connecting piece being of a uniform diameter over its length and the radially outer diameter of said outer sleeve being of a uniform diameter for its length below said connecting member, the upper end of said outer wall being held against flexural displacement by the cooperating relationship of said outer wall with said connecting piece and inelastic sleeve so that the pressure medium introduced into the closed space formed within said double collar does not deform said inner and outer walls relative to a supporting or holding member whereby leakage through said double collar could develop due to failure at the locations of flexural displacement, a guide connected to and extending downwardly from the interconnected lower ends of said inner and outer walls, the inner surface of said guide having a frusto-conical configuration converging inwardly from the lower end thereof in the upward direction, said guide having a first outwardly facing surface extending from its lower end and disposed in contact with the inner surface of said inelastic sleeve and a second outwardly facing surface extending upwardly above and spaced radially inwardly from said first outwardly facing surface, a groove formed in said second outwardly facing surface, and a bead formed on the integrally connected portions of said lower end of said inner and outer walls and facing radially inwardly and being seated within the groove in said second outwardly facing surface of said guide.

3,856,344

ORTHOTROPIC TRAILER

Frederick W. Loeber, Downey, Calif., assignor to Ameron, Inc., Monterey Park, Calif.

Continuation-in-part of Ser. No. 221,608, Jan. 28, 1972, abandoned. This application Mar. 16, 1973, Ser. No. 341,874
Int. Cl. B62d 33/02
U.S. Cl. 296—28 M 15 Claims



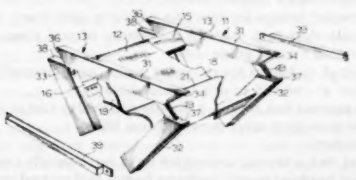
1. In a highway trailer, a load-support bed including a pair of spaced apart and generally parallel, rigid, elongated open-section metal beams each having at least a vertical web and a bottom flange, and a series of rigid, elongated open-section load-support members each being made of metal and shaped to provide a top flange, a bottom flange below the top flange, and a web integral with and extending between the top flange and the bottom flange, the series of load-support members being mounted on the beams in a side-by-side relation with the bottom of each top flange being in substantially continuous contact with the top of each beam and being rigidly bonded to each beam, the web and the bottom flange of each load-support member also being rigidly bonded to each beam, the top flanges of the load-support members being rigidly bonded together to form a continuous rigid panel extending lengthwise relative to the beams for providing a load-supporting deck and also serving as a compression flange for the vertical webs of the beams and a tension flange for the webs of the load-support members to form a stiff, unitary load-support bed of orthotropic design.

3,856,345

FOLDING CHAIR

Charles Randolph Beckley, 2708 Woodley Pl., N. W., Washington, D.C. 20008

Filed July 23, 1973, Ser. No. 381,759
Int. Cl. A47c 4/32
U.S. Cl. 297—16 16 Claims



1. A seat which is foldable to assume either an erect sittable condition or a collapsed condition wherein the seat includes

at least two folding frame members, each of which comprises: an arm having first and second ends and extending generally in a horizontal direction when the seat is in the erect condition;

a first leg for supporting the first end of said arm when the seat is in the erect condition;

means for pivoting one end of the first leg adjacent to the first end of the arm to extend the first leg from the arm at an angle thereto when the seat is in the erect condition and to fold the first leg to extend along the arm in close proximity thereto when the seat is in the collapsed condition, said first end of said arm and the adjacent end of said leg forming means for supporting the seat in self-supporting, collapsed, storable condition with the arm and leg extending vertically;

a second leg for supporting the second end of said arm member when the seat is in the erect condition; and

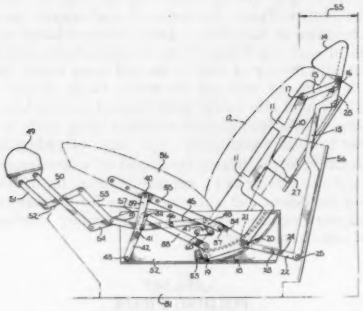
a link member pivoted adjacent to the second end of the arm and secured to the second leg, wherein said link member extends from said arm and past said first leg when the seat is in the collapsed condition to fold said second leg to extend along said first leg in close proximity thereto and wherein the link member extends generally along said arm to project said second leg at an angle from said arm when the seat is in the erect condition.

3,856,346

RECLINING CHAIR

Marvin J. Herman, Los Angeles, Calif., assignor to Herman, Kulo & Modell, Los Angeles, Calif.

Filed Dec. 11, 1972, Ser. No. 313,787
Int. Cl. A47c *1/037*
U.S. Cl. 297—61 **4 Claims**



1. A reclining chair comprising:

a base which includes a pair of spaced-apart parallel guide slots each having a generally curved shape;

a backrest frame having an upper portion for receiving a cushion and a lower portion which includes a pair of spaced-apart parallel shoes;

connector means for movably coupling said shoes to said guide slots such that the movement of said shoes is restricted by said guide slots;

a pair of seat links for receiving a seat, each pivotally coupled at one end to one of said shoes;

seat support link means, pivotally coupled to said seat links for providing support to said seat links;

a headrest;

a first and a second connector links for pivotally coupling said headrest to said backrest frame, said second connector link being pivotally coupled to at least one of said shoes and to said base so that downward movement of said shoes is translated into upward movement of said backrest;

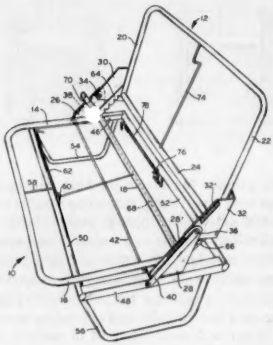
whereby as said chair is reclined said connector means advance within said guide slots and said backrest is raised.

3,856,347

CONVERTIBLE AND REVERSIBLE SEAT STRUCTURE

Richard A. Bell; Earl C. Wallace, and Ted W. Winters, all of Andrew, Ind., assignors to General Engineering Manufacturing Corp., Andrews, Ind.

Filed Sept. 13, 1972, Ser. No. 288,741
Int. Cl. B60n *1/02*
U.S. Cl. 297—92 **10 Claims**



1. A convertible and reversible seat structure comprising:

a load supporting base;

two load supporting frames:

bracket means attached to opposite sides of said load supporting frames;

means pivotally interconnecting said frames and said base including a single pair of connecting arms attached at one end to said bracket means on opposite sides of said load supporting base;

a rod attached to the other ends of said connecting arms and pivotally attached to respective opposite sides of said base;

latching means for positively and selectively engaging one of said frames with said base;

means for selectively maintaining one of said frames in a position relative to the other of said frames; and

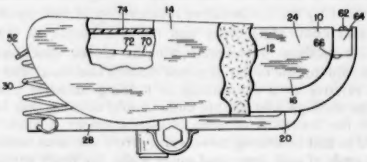
means preventing said frames from moving beyond a predetermined position.

3,856,348

CYCLE SADDLE WITH PLASTIC BASE

Martin J. Bird, Norwalk, Ohio, assignor to Persons-Majestic Mfg. Company, Worcester, Mass.

Filed June 28, 1973, Ser. No. 374,667
Int. Cl. B62j *1/00*
U.S. Cl. 297—195 **9 Claims**



1. A cycle saddle comprising a one piece molded plastic base including a pommel and integral seat portion, the seat portion having diverging side edges, side flanges on the base extending downwardly from the pommel area and the seating area,

a truss secured at its forward end to the forward end portion of the pommel and extending to the rear edge area of the seat portion, springs interposed between the truss and the rear edge of the plastic base,

said base being generally self-sustaining but deflective downwardly under conditions of load in the seating area, and a substantially rigid elongated metal member fastened at one end to the pommel and at the rear edge portion of the seat portion, said metal member being spaced from the molded plastic base in the seating area.

3,856,349

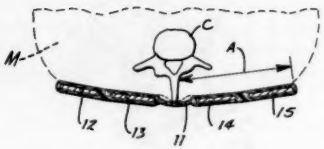
PORTABLE VERTEBRAL COLUMN SUPPORT

Richard U. Light, Delton, Mich., assignor to Flat-Back Corporation, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 63,253, Aug. 12, 1970, Pat. No. 3,709,557, which is a continuation-in-part of Ser. No. 852,693, Aug. 25, 1969, abandoned. This application Nov. 13, 1972, Ser. No. 305,664The portion of the term of this patent subsequent to Jan. 9, 1990, has been disclaimed.

Int. Cl. A47c *7/42*

U.S. Cl. 297—230 **17 Claims**



1. A portable vertebral support device for use as a medical appliance in supporting the vertebral column of a user and designed for use between the user's back and an external supporting surface such as a seat back, said support device consisting of a substantially flat and elongated pad having a width approximately no greater than the width of the user's back so that the support device directly engages the back muscles of the user, and said support device being relatively rigid throughout the complete longitudinal length thereof but being provided with lateral flexibility to conform to the user's back, and to permit folding, said pad comprising:

elongated relatively rigid stiffening members positioned substantially parallel with respect to each other and spaced apart to define a central portion therebetween of width sufficient, but no greater than that necessary, to span the palpable portion of the vertebral column of the user, said central portion having a width which is a small fraction of the overall width of said pad; and

retaining means affixed to said stiffening members for holding same in a predetermined position with respect to each other and extending at least substantially the full length and width of said stiffening members;

said device being positionable so that the longitudinal axis thereof extends parallel to the vertebral column of the user with said central portion substantially spanning at least the palpable portion of the vertebral column of the user and said stiffening members being positioned on opposite sides of the vertebral column and disposed for contact with at least those of the user's back muscles which are closely adjacent his vertebral column.

3,856,350

CHAIRS

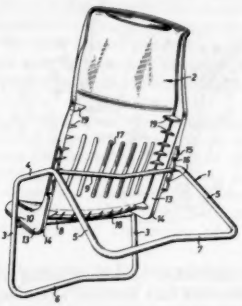
Dennis Duke, West Kensington; Michael James Swain, and Alan Cracknell, both of St. Albans, all of England, assignors to 1, 2, Hertfordshire 5 EN

Filed Mar. 19, 1973, Ser. No. 342,484

Claims priority, application Great Britain, Mar. 21, 1972, 13276/72

Int. Cl. A47c *1/00*

U.S. Cl. 297—355 **2 Claims**



1. A chair comprised of a base and body;

said body including a seat and a back disposed at an angle with respect to said seat;

said seat having opposite sides and having a respective lip projecting outwardly from and extending a distance along each said seat side;

said back carrying a plural position chair base engagement means;

said base including a support for the chair; said base also including respective portions extending upwardly past said seat lips, and on those said base portions are respective guide elements for said lips, which said guide elements engage said lips in supporting relationship while said lips are slidable along their length on said guide elements;

said base also carrying plural positon chair back engagement means that are positioned and adapted to engage the said chair base engagement means on said back at any of a plurality of positions along said back and which engage said chair base engagement means on said back at one of said positions;

said guide elements comprising a respective pair of guiding posts for each said lip, with each said post extending over its said lip and one of said posts of each pair being above its respective said lip and the other said post of that said pair being below its respective said lip; said posts of each said pair being spaced apart a distance which enables the respective said lip to slide along its length between its said posts and to be guided in movement against substantial up and down shifting;

said seat and said back being rigid and being rigidly connected to each other;

said chair back engagement means on said base comprising a cross rail means and said chair base engagement means on said back comprises at least one rack with a plurality of cross rail means receiving notches thereon extending along the height of said back; said cross rail means being selectively engaged in one said notch and being movable to be engaged in each other said notch;

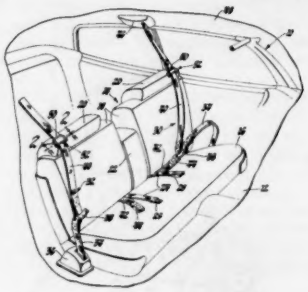
the said lip supporting posts below both said lips being joined and form a cross rail across said base.

3,856,351

VEHICLE OCCUPANT RESTRAINT BELT SYSTEM WITH COMFORT CLIP

Louis P. Garvey, West Bloomfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 3, 1973, Ser. No. 421,213
Int. Cl. A62b *35/00*
U.S. Cl. 297—388 **2 Claims**



1. In an automotive vehicle including an occupant seat having cushion and back portions, a restraint belt system for a seated occupant comprising:

lap and shoulder belts with first ends secured to a common first buckle component, a second buckle component for selectively attaching the first buckle component so as to secure the belts in an occupant restraining position, the lap belt extending generally laterally with respect to the vehicle across the occupant's lap while in the restraining position, and the shoulder belt extending diagonally across the occupant's chest while in the restraining position;

an automatic locking type belt retractor receiving the other end of the lap belt so as to normally tension the lap belt across the lap of the belted occupant and to store the lap belt upon detachment of the buckle components;

an inertia locking type belt retractor receiving the other end of the shoulder belt so as to normally tension the shoulder belt across the chest of the belted occupant and to store the shoulder belt upon detachment of the buckle components;

a stop through which the shoulder belt passes, the stop being located toward the shoulder belt retractor with respect to the shoulder of the belted occupant over which the shoulder belt passes while extending diagonally across the occupant's chest in the restraining position, and the stop allowing the shoulder belt to be freely pulled in either direction therethrough so that the shoulder belt is not impeded thereby during movement to the restraining position and does not, in and of itself, prevent the shoulder belt retractor from tensioning the shoulder belt across the occupant's chest; and

a plastic comfort clip positioned on the shoulder belt between the first buckle component and the stop, the comfort clip being of a one-piece construction and including a generally planar base of a rectilinear configuration that extends between the opposite edges of the shoulder belt in a generally parallel relationship with respect to the plane of this belt, the ends of the base adjacent each edge of the shoulder belt having generally rectilinear configurations extending generally parallel to the edges of the shoulder belt, and

a pair of clamping portions integrally connected to the rectilinear ends of the base adjacent each edge of the shoulder belt and extending about the respective edges of the shoulder belt back toward each other so that the shoulder belt is positioned between the clamping portions and the base of the clip, the clamping portions defining a slot through which the shoulder belt may be inserted intermediate the ends thereof so as to be positioned between the clamping portions and the base,

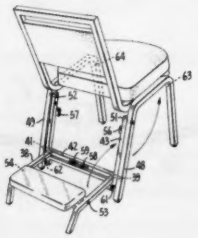
the base and the clamping portions of the clip cooperating to clamp the shoulder belt therebetween with a force that is not so large as to prevent the clip from being readily slid along the shoulder belt by a manual effort to provide adjustment thereof, the clamping force being sufficiently large to prevent the shoulder belt retractor from pulling the shoulder belt through the clip, and the clip engaging the stop to prevent movement therethrough so that appropriate manual adjustment of the clip along the shoulder belt will prevent the shoulder belt retractor from tensioning the shoulder belt across the occupant's chest.

3,856,352

STACKABLE CHAIR KNEELER

Arno M. Jacobi, Sr., Belmont, Calif., assignor to Walter Jacobi & Sons, Inc., Belmont, Calif.

Filed June 18, 1973, Ser. No. 371,161
Int. Cl. A47c *7/50, 9/14*
U.S. Cl. 297—425 **23 Claims**



19. A stackable chair kneeler, comprising

a chair having a seat and substantially inverted U-shaped side elements providing downwardly diverging legs, said chair being stackable with other chairs of similar configuration and with its legs nesting with the legs of the chairs above and below,

a subframe pivotally mounted to the legs of said chair adjacent to said seat and formed for selective swinging movement between an operative position in substantially coplanar alignment between the rear legs of said chair and a storage position closely underlying said seat,

a kneeler frame pivotally on said subframe for selective swinging movement between a retracted position in generally coplanar alignment with said subframe and a lowered position for kneeling, and

holding means formed for releasably retaining said subframe in said operative and storage positions.

3,856,353

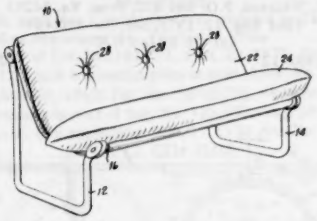
CUSHION CONNECTION

Andrew I. Morrison, Brooklyn, and Bruce R. Hannah, Staten Island, both of N.Y., assignors to Knoll International Inc., New York, N.Y.

Filed Oct. 11, 1972, Ser. No. 299,619
Int. Cl. A47c *7/14*
U.S. Cl. 297—452 **11 Claims**

1. An item of furniture comprising a substrate having an aperture therein, and a cushion having a tufting assembly

which creates a tufting effect in the cushion and which includes a button secured thereto which is buttoned through the



aperture in the substrate to provide the sole means for securing the cushion to the substrate.

3,856,354

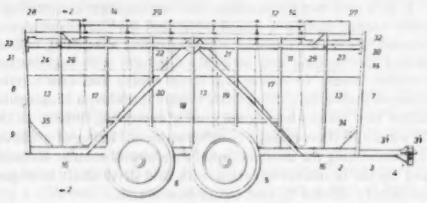
SUGAR CANE WAGON AND THE LIKE

Darryl B. Davis, 624 W. St. Peter St., New Iberia, La. 70560

Filed Mar. 13, 1972, Ser. No. 234,268

Int. Cl. B65g *67/50*

U.S. Cl. 298—10 **12 Claims**



1. A wagon-like vehicle capable of traversing soft terrain while carrying at least 10 tons of cut sugar cane or the like and adapted for movement by a prime mover, comprising

a rectangualr frame assembly composed of a pair of steel side beams rigidly interconnected together in a parallel spaced-apart manner by a plurality of spaced-apart steel cross beams and having a lateral pivot axis spaced rearwardly of the forward end of said frame assembly a distance substantially equal to 11/20ths of the length of said frame assembly,

a forward end wall assembly mounted on the forward end of said frame assembly,

a rearward end wall assembly mounted on the rearward end of said frame assembly,

a first open lattice-like side wall assembly mounted between said end wall assemblies along one side of said frame assembly and outwardly tilted therefrom,

a second open lattice-like side wall assembly mounted between said end wall assemblies along the opposite side of said frame assembly and outwardly tilted therefrom,

said second side wall assembly having a height greater than the height of said first side wall assembly,

a forward axle assembly fixedly mounted laterally across said frame assembly at a location spaced rearwardly from the forward end of said frame assembly a distance substantially equal to 8/20ths of the length of said frame assembly,

a rear axle assembly fixedly mounted laterally across said frame assembly at a location spaced from said forward axle assembly a distance substantially equal to one-fourth of the length of said frame assembly,

a pair of hanger mount members mounted on the upper edge of said first side wall assembly adjacent said end wall assemblies and raised to a height greater than that of said second side wall assembly,

a cable hanger member adapted to rest on said hanger mount members,

a plurality of flexible carrying lines interconnected between said cable hanger member and the upper edge of said second sidewall assembly and draped against the inside surfaces of said sidewall assemblies and across said frame assembly at spaced-apart locations therealong,

a drawbar extending forwardly of the forward end of said frame assembly and having a vertical recess in its forward end,

a first angle member vertically located on the end of said drawbar at one side of said recess and having one side provided with a plurality of bolt holes and arranged to form a forward extension of said side of said recess,

a second angle member vertically located on the end of said drawbar at the other side of said recess and having one side provided with the same plurality of bolt holes and arranged to form a forward extension of said other side of said recess,

a link member having a cylindrical bushing-like portion at one end which is insertable in said recess and between angle members and further having spaced apart parallel extensions having a plurality of bolt holes matching selected ones of said bolt holes in said angle members,

a plurality of spacing sleeves located between said link member extensions and connecting said bolt holes therein,

a plurality of bolts adapted to be inserted through said bolt holes in said linking means and said angle members and through said spacing sleeves for securing said link member to said drawbar,

coupling means having provision at one end for interconnection with said prime mover, and

connector means for interconnecting said coupling means and said bushing-like portion of said link member.

3,856,355

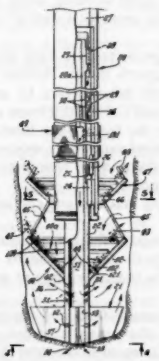
RECOVERY OF SUB-SURFACE METALS

Donovan B. Grable, Long Beach, Calif., assignor to Wasteland Reclamation Corp., Long Beach; Bill C. Laney, Torrance and William W. Haefliger, San Marino, all of, Calif., part interest to each

Continuation-in-part of Ser. No. 338,151, March 5, 1973, Pat. No. 3,790,213. This application July 18, 1973, Ser. No. 380,362

Int. Cl. E21c *45/00*

U.S. Cl. 299—8 **24 Claims**



1. In the method of recovering segregatable particles in an underground formation, the steps that include

a. progressively rotatably cutting into the underground formation both up and down and laterally to produce an underground swath, and to loosen said particles, said lateral cutting being carried out during up and down cutting,

b. delivering liquid in a pressurized stream to said swath to displace the loosened particles in the delivered water, and

c. locally collecting the displaced particles in a collection zone in said swath, during said cutting, for subsequent retrieval at the surface.

3,856,356

METHOD OF MINING MINERAL

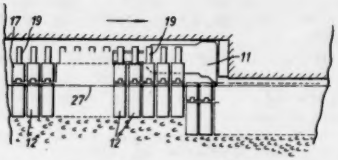
Archelaius Dawson Allen, Preston, and Fred Small, Lathom, both of England, assignors to Gullick Dobson Limited, Lancashire, England

Filed Mar. 21, 1973, Ser. No. 343,223

Claims priority, application Great Britain, Mar. 24, 1972, 13973/72

Int. Cl. E21c *27/24*

U.S. Cl. 299—11 **1 Claim**



1. A method of mining mineral from a mineral face which comprises the following steps:

positioning a line of self-advancing mine roof supports along and spaced from said mineral face, each of said roof supports having an extensible and retractable roof supporting extension bar, a section of a path defining means and a double-acting pressure-fluid ram means for advancing the support and for advancing said section of the path defining means, the sections of path defining means of the line of supports collectively defining with said mineral face a path parallel to the mineral face,

driving a self-propelled mining machine, which incorporates its own driving motor and is propelled by traction with a surface of the mine working, along said path so that said mining machine removes a web of mineral from the mineral face,

operating said pressure-fluid ram means to advance the mine roof supports in turn behind the mining machine and towards the mineral face by an amount which is a fraction (e.g. half) of the thickness of the web of mineral removed from the face by the mining machine,

advancing said roof supporting extension bars of the supports towards the mineral face to provide roof support in the vicinity thereof,

driving the mining machine on a return journey along said path,

operating the pressure-fluid ram means of each support to advance the path defining means thereof towards the mineral face by the same amount as said advance of the supports,

operating the pressure-fluid ram means of each support so as to advance the supports further so that the total advance thereof is equal to the total thickness of the web of mineral removed from the mineral face by the mining machine, and

operating the pressure-fluid ram means of each support to advance the path defining means thereof further by the same amount of said further advance of the supports.

3,856,357

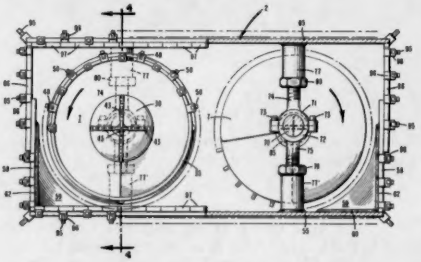
COMBINATION ROTOR-BOX CUTTER MINING MACHINE AND METHOD OF MINING

George C. Wharton, P.O. Box 450, Wise, Va. 24293

Filed Aug. 22, 1973, Ser. No. 390,409

Int. Cl. E21c *27/10*

U.S. Cl. 299—12 **12 Claims**



1. In a coal mining machine the combination comprising a rotor means having a burster element on the forward end thereof, a tubular element with forwardly extending cutting means surrounding and in axial alignment with said burster element, means to rotate said rotor means and said tubular element including a drive shaft means therefor, a rectangular cutter box means having forwardly extending cutters at the forward end thereof, said cutter box means being of a dimension exceeding the crosssectional area of said tubular element, and means in interconnection with said drive shaft to impart oscillatory motion to said cutter box means.

3,856,358

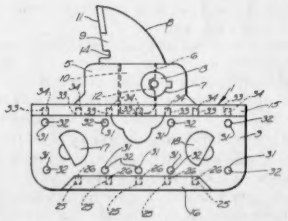
WEAR-RESISTANT INSERTS FOR IN SURFACES OF THE LINKS OF CUTTER CHAINS AND THE LIKE TO RETARD WEAR THEREOF

Claude B. Krekeler, Cincinnati, Ohio, assignor to The Cincinnati Mine Machinery Co., Cincinnati, Ohio

Filed Apr. 27, 1973, Ser. No. 355,262

Int. Cl. E21c *27/28*

U.S. Cl. 299—82 **19 Claims**



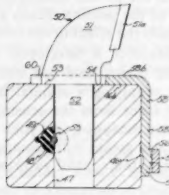
1. In the combination of a chain for a mining machine or the like and a supporting means for said chain with which said chain has sliding contact, wherein said chain is made up of a plurality of links and wherein at least some of said chain links and said supporting means have surfaces subject to sliding-type wear therebetween, means for protecting at least selected ones of said surfaces, said means comprising discrete hard wear-resistant insert elements of circular cross section embedded axially in preformed holes in said surfaces to be protected.

3,856,359

ANTI-CORING DEVICE FOR USE WITH BIT MOUNTING MEANS ON MINING, EARTH WORKING AND DIGGING MACHINES

Claude B. Krekeler, Cincinnati, Ohio, assignor to The Cincinnati Mine Machinery Co., Cincinnati, Ohio

Division of Ser. No. 181,771, Sept. 20, 1971, Pat. No. 3,778,112, which is a continuation-in-part of Ser. No. 842,791, June 30, 1969, Pat. No. 3,622,206, which is a continuation-in-part of Ser. No. 753,398, Aug. 19, 1968, abandoned. This application Sept. 21, 1973, Ser. No. 399,468
Int. Cl. E21c 35/18
U.S. Cl. 299—92 16 Claims



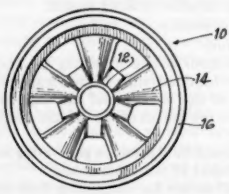
1. An anti-coring device for use with bit and mounting means assemblies mounted on the driven elements of mining machines, digging machines and earthworking machines wherein each of said mounting means has at least one forward surface facing the cutting direction and subject to coring, said mounting means having a perforation therein adapted to receive the shank of a bit, said shank receiving perforation forming an opening in said at least one surface, said shank receiving perforation at said opening being countersunk, said countersink forming a gauge-determining abutment surface adapted to cooperate with a matching gauge-determining abutment surface on said bit, said anti-coring device comprising a disposable element adapted to cover a part at least of said at least one surface of said mounting means, means for detachably maintaining said anti-coring device at said at least one surface of said mounting means, said anti-coring device having a perforation therethrough so positioned therein as to be coaxial with said shank receiving perforation when said anti-coring device is in position on said mounting means, said perforation in said anti-coring device being so sized as to expose said gauge-determining abutment surface on said mounting means.

3,856,360

ALUMINUM BASE ALLOY DIE CASTING WHEEL

Richard S. Lindberg, Homewood, and G. Leslie Armstrong, Crete, both of Ill., assignors to U.S. Reduction Co., East Chicago, Ind.

Division of Ser. No. 85,372, Oct. 30, 1970, Pat. No. 3,726,672. This application Mar. 1, 1973, Ser. No. 337,002
Int. Cl. B60b 1/08; C22c 21/02
U.S. Cl. 301—65 2 Claims



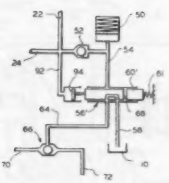
1. A die-cast aluminum automobile wheel having a flange, spiders and a rim, said wheel consisting essentially of aluminum, and by weight percentage of the total composition, magnesium 0.25 to 0.6%, copper 0.25 to 0.6%, iron 0.5 to 1.5%, silicon 11 to 13.5%, chromium 0.25 to 0.4%, a maximum of 3% zinc, a maximum of 0.5% manganese and a maximum of 0.2% of each of titanium, nickel, tin and lead.

3,856,361

VEHICLE BRAKING SYSTEM

Allan R. Swanson, St. Joseph, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Jan. 5, 1973, Ser. No. 321,422
Int. Cl. B60t 11/32
U.S. Cl. 303—6 R 8 Claims



1. A vehicle braking system comprising: first braking means responsive to fluid pressure for applying a first braking force; second braking means responsive to fluid pressure for applying a second braking force; primary fluid supply means for supplying primary fluid pressure to said first and second braking means to actuate said first and second braking means; auxiliary fluid supply means for supplying auxiliary fluid pressure to said first and second braking means upon a release of fluid pressure in said primary fluid supply means, said auxiliary fluid supply means including flow control means for isolating one of said braking means from the supply of said auxiliary fluid pressure independently of the supply of said auxiliary fluid pressure to the other braking means in response to the release of fluid pressure by said one of said braking means, first valve means responsive to fluid pressure from both of said primary and said auxiliary fluid supply means for supplying said first braking means fluid pressure from one of said primary and said auxiliary fluid supply means, and second valve means responsive to fluid pressure from both of said primary and said auxiliary fluid supply means for supplying said second braking means fluid pressure from one of said primary and said auxiliary fluid supply means, said auxiliary fluid supply means including a first fluid passage interconnecting said flow control means and said first valve means and a second fluid passage interconnecting said flow control means and said second valve means, said flow control means being responsive to a predetermined drop in fluid pressure in either one of said passages for discontinuing the supply of auxiliary fluid pressure thereto.

3,856,362

ELECTRONICALLY CONTROLLED SOLENOID REGULATED SERVOMOTOR

Donald W. Howard, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed May 31, 1973, Ser. No. 365,798
Int. Cl. B60t 13/74
U.S. Cl. 303—7 6 Claims

1. In a tow vehicle-trailer braking system, electrical means for generating an operational signal from an actuation signal for the wheel brakes of the tow vehicle to regulate the operation of a servomotor in the trailer which provides an output force to actuate the wheel brakes of the tow vehicle, said electrical means comprising:

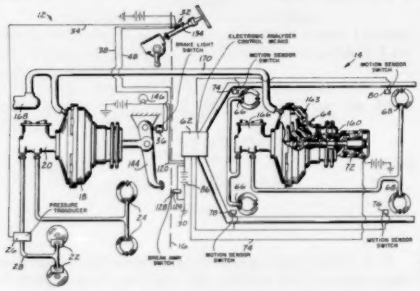
first transducer means for converting said actuation signal for the wheel brakes of the tow vehicle into a corresponding first electrical signal;

weight simulation means for modifying the effects of the actuation signal in response to a change in the mass of the trailer to maintain optimum braking between the tow vehicle and the trailer;

adjustable means for altering the effective operating range of the first electrical signal to establish a time limit between actuation of the wheel brakes of the tow vehicle and the trailer;

transistor means connected to said first transducer means for amplifying said first electrical signal;

dampening means for uniformly suppressing said electrical signal upon termination of the actuation signal to correspondingly inhibit actuation of the wheel brakes of the trailer;



solenoid means connected to said transistor means for controlling the flow of a first fluid and a second fluid in response to the amplified electrical signal to create a pressure differential in the servomotor and sequentially actuate the wheel brakes of the trailer with the tow vehicle; and

holding means responsive to an operator for generating a first switching signal to continually actuate the wheel brakes of the trailer independent of said actuation signal for the wheel brakes of the tow vehicle.

3,856,363

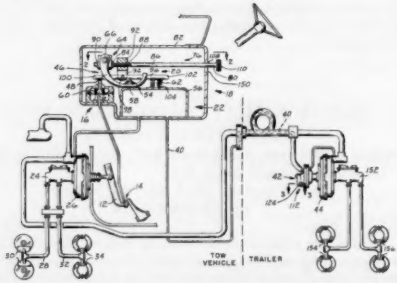
ADJUSTABLE LINKAGE FOR TRANSMITTING THE OUTPUT FROM A SENSOR TO A CONTROL VALVE

John T. Kasselmann, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Sept. 24, 1973, Ser. No. 400,479

Int. Cl. B60t *13/10*

U.S. Cl. 303—7 **6 Claims**



1. In a tow vehicle-trailer braking system having a first servomotor for supplying the wheel brakes in the trailer with a braking force in response to an actuation force derived by a sensing means responding to an input force applied to a brake pedal for operating a second servomotor which supplies the wheel brakes in the tow vehicle with a braking force, linkage means for communicating a linear output force from the sensing means to a control valve means wherein an operational signal is generated to develop said actuation force, said linkage means comprising:

a housing for retaining said control valve means and said sensing means in a fixed position;

yoke means attached to the housing;

rod means pivotally connected to said yoke means;

lever means pivotally connected to said rod means for transferring said output force of the sensing means to the control valve; and

adjustable means connected to said rod means for changing the position of the pivotal connection of the lever means with respect to the sensing means and the control valve means to modify the effect of the output force from which said actuation force is developed to provide optimum braking in the trailer, said rod means responding to an operator for supplying a manual input to override the linear output force from the sensing means by pivotally moving said rod means on said yoke means and supplying the control valve means with an independent operational force to operate the control valve means.

3,856,364

VEHICLE ANTISKID BRAKING SYSTEM

James Mangold, Tremblay-les-Gonessethat, France, assignor to Societe Anonyme D.B.A.

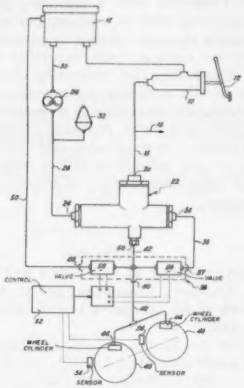
Continuation of Ser. No. 884,090, Dec. 11, 1969, abandoned.

This application Oct. 21, 1971, Ser. No. 191,466

Claims priority, application France, Dec. 27, 1968, 68.181037

Int. Cl. B60t *8/06*

U.S. Cl. 303—21 F **9 Claims**



1. In a vehicle antiskid braking system:

a fluid pressure source;

a fluid reservoir;

an antiskid control device including electrically operated valve means for controlling fluid communication between the brakes of the vehicle and the fluid pressure source and between the brakes of the vehicle and the fluid reservoir;

operator-operated fluid pressure generating means for operating the brakes of the vehicle; and

a relay control device for controlling fluid communication between the pressure source and the antiskid control device in response to operation of said operator-operated means;

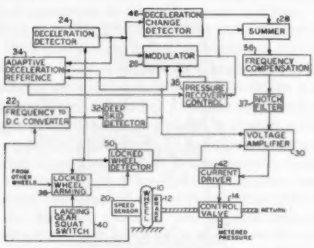
said relay control device including a housing defining a bore therewithin; a first port communicating said bore with

said pressure source, a second port communicating said bore with the inlet of the antiskid control device, a third port communicated with the operator-operated means, a fourth port communicated with the fluid pressure level communicated to the brakes of the vehicle, and valve means responsive to the fluid pressure level at said third port for initiating fluid communication between the first and second ports upon actuation of said operator-operated means, said valve means being further responsive to the fluid pressure level at said fourth port to terminate fluid communication between the first and second ports when the pressure level in the brakes of the vehicle attains a predetermined level, said valve means opening to again permit fluid communication between the first and second ports if the pressure level at said fourth port drops below said predetermined level upon actuation of said antiskid control device, said predetermined level being proportional to the fluid pressure level developed in the operator-operated means.

3,856,365
ANTI-SKID CONTROL SYSTEM FOR AIRCRAFT

John R. Steigerwald, Canton; John P. Rasmussen, and Angelo T. Crapanzano, both of Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 3, 1972, Ser. No. 294,553
Int. Cl. B60t *8/12*
U.S. Cl. 303—21 BE **13 Claims**



1. An anti-skid control system for a vehicle having a rotatable wheel, hydraulic brake means associated with the wheel, current controlled valve means regulating hydraulic pressure to the brake means, and sensor means connected to the wheel and producing a DC signal proportional to wheel rotational velocity, comprising:

a modulator connected to the valve means and controlling the application of brake pressure, the modulator having an initialization circuit associated therewith;

a minor control loop connected to the sensor means, valve means and initialization circuit and operative on a first incipient skid to totally release brake pressure and initialize the modulator to reapply brake pressure to a level determined by the severity of the first incipient skid;

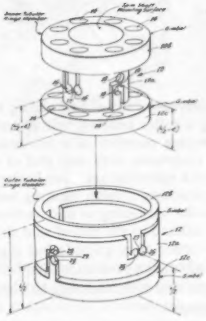
a major control loop interconnected between the sensor means, minor control loop and modulator and applying to the modulator a variable deceleration reference signal indicative of a desired rate of deceleration of the wheel and a deceleration signal indicative of the actual rate of deceleration of the wheel, the modulator controlling the application of brake pressure according to the correlation between the two signals, the variable deceleration signal being a function of the signal indicative of the actual rate of deceleration and being initialized by the minor control loop to a level commensurate with the degree of severity of the first incipient skid; and

a deceleration change detector connected to the major control loop and applying to the valve means signals indicative of the rate of change of wheel deceleration with respect to time.

3,856,366
GYROSCOPE UNIVERSAL FLEXURE SUSPENSION ASSEMBLY

Leon Weisbord, New York, N.Y., and Walter J. Krupick, Succasana, N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Jan. 8, 1973, Ser. No. 322,018
Int. Cl. G01c *19/18*
U.S. Cl. 308—2 A **5 Claims**



1. A flexure hinge assembly comprising:

a pair of concentric tubular hinge members attached to one another, each of said hinge members having at least two pairs of adjacent apertures extending through the walls thereof and each of said pairs of apertures forming a flexure bar, the inner tubular hinge member having such flexure bars alternately extending parallel and perpendicular to the longitudinal axis of the assembly, and the outer tubular hinge member also having said flexure bars extending parallel and perpendicular to the longitudinal axis of the assembly with said parallel and perpendicular flexure bars of said outer hinge member located a distance L/2 from the bottom surface of said outer member, and said parallel flexure bars of said inner member and said perpendicular flexure bars of said inner member located at different distances of the bottom surfaces of said inner members;

said inner tubular member being slotted to form a first gimbal at one end thereof connected to the perpendicular flexure bars of said inner tubular members and a second gimbal at the other end thereof connected to the parallel flexure bar of said inner members; and said outer tubular member being slotted to form a gimbal at one end thereof concentric with the first gimbal and connected to the perpendicular flexure bar of said outer member, and a gimbal at the other end thereof concentric with said second gimbal and connected to the parallel flexure bars of said outer members.

3,856,367
SPIRAL-GROOVED BEARING AND METHOD OF MANUFACTURE

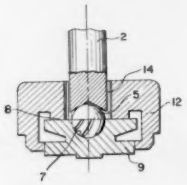
Horst Wohnhaas; Kurt Haas, both of Friedrichshafen, and Manfred Granzow, Meckenbeuren, all of Germany, assignors to Dornier Systems GmbH, Friedrichshafen, Germany

Filed Feb. 16, 1973, Ser. No. 333,312

Claims priority, application Germany, Mar. 1, 1972, 2209712

Int. Cl. F16c *17/16, 17/04;* **B21d** *53/10*

U.S. Cl. 308—9 **24 Claims**



1. A hydrodynamically-acting sliding bearing; comprising, a shaft having a roller bearing ball affixed to the end thereof, and a supporting member of a hardenable alloy adapted to operatively cooperate with said end of said shaft and having an imprint of a spherical segment formed in an initially plane surface by punching a roller bearing ball into said plane surface prior to the hardening of said hardenable alloy, said roller bearing ball affixed to the end of said shaft having dimensions of the same order of magnitude but slightly smaller than the dimensions of said imprint of said spherical segment to form a gap between said roller bearing ball and said imprint of said spherical segment.

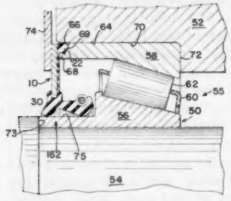
3,856,368
FLUID SEAL FOR BEARING ASSEMBLY

Kare Andersen, 832 Carol Ave., Elgin, Ill. 60120

Continuation of Ser. No. 147,990, May 28, 1971, abandoned. This application May 25, 1973, Ser. No. 363,829

Int. Cl. F16c *33/78*

U.S. Cl. 308—187.2 **5 Claims**



1. A unitized bearing and seal assembly comprising in combination, radially inner and outer races, a plurality of rotatable bearings disposed between said inner and outer races and being positioned therein by means of a cage, one of said inner and outer races having an axially extending collar with a radially directed sealing surface thereon, a groove in the other of said races, said groove having an axially extending portion and a radially undercut portion, a seal unit forming a part of said bearing and seal assembly, said seal unit including a relatively rigid, radially extending stiffener portion closing off a major portion of the area lying between said inner and outer races, a sealing lip extending substantially axially outwardly from and bonded to one end of said relatively rigid stiffener, said lip having a seal band portion thereof formed by the convergence of a pair of frusto-conical surfaces, and an annular spring overlying said seal band whereby said seal band is urged into engagement with said sealing surface on said one of said races, and a secondary sealing bead formed on the other end of said stiffener portion, said secondary sealing bead having a bead portion of a shape generally conforming to the shape of said groove and other of said races, whereby an axially directed force on said stiffener will force said secondary sealing head radially outwardly from said groove and into snug sealing engagement with a member fixed with relation to said second race, said bead portion of said secondary sealing bead being adapted when received in said race groove to position and support said seal assembly in relation to said bearing assembly.

3,856,369
METHOD FOR STOWING-AWAY CASSETTES IN A SUITABLE-HOLDER

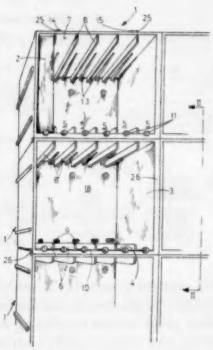
Michel Commiant, Molenbeek-Saint-Jean, Belgium, assignor to Compagnie Generale des Isolants (Cogebi), Brussels, Belgium

Filed Mar. 16, 1973, Ser. No. 342,261

Claims priority, application Belgium, Mar. 21, 1972, 780968; Aug. 18, 1972, 787724

Int. Cl. B65d *39/00;* **A47b** *73/00;* **F16b** *12/00*

U.S. Cl. 312—107 **6 Claims**

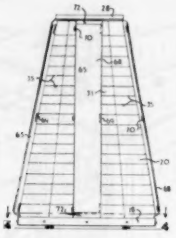


1. A holder for cassettes, said cassettes being parallelepiped-shaped, said holder comprising a parallelepiped-shaped box whose front side is open and which comprises an inner back face opposite said open front side, inner side faces and inner top and bottom faces, the bottom face being divided into parallel compartments adapted to receive cassettes, said compartment extending at right angles to the open front side, whereby the width and the length of the compartments correspond substantially to the width and length of a cassette, whereby a plurality of cassettes may be stored in adjacent upright positions on one of the sides thereof in said compartments, said box further comprising resilient members provided on said inner back face inside each of said compartments, a rigid stop for each of said compartments opposite each of said resilient members and rigid guide members provided on said inner top face inside each of said compartments, each of said resilient members operating at right angles to said inner back face toward each of said rigid stops whereby when a cassette is disposed in a compartment, said cassette is clamped between the resilient member and the corresponding rigid stop, the rigid guide members being arranged so as to guide a cassette into each of said compartments and retain said cassettes against the inner bottom face thereof.

3,856,370
STAND FOR STORING, INDEXING AND DISPLAYING STOCK

Alfred A. Burrell, 10323 106th St., Edmonton, Alberta, Canada

Filed Oct. 19, 1973, Ser. No. 407,830
Int. Cl. A47f 3/14
U.S. Cl. 312—118 10 Claims



1. For storing, indexing and displaying stock, a stand of upright frusto-conical form comprising a horizontal circular base; a circular top of smaller diameter spaced thereabove; base surfacing members of alternate rectangular and truncated sector shape secured to the upper side of said circular base each with narrowly spaced upstanding side flanges; and vertical metal partitions arranged between said base and top; said partitions extending outward to the circumference of the stand with their lower edges being supported on said base and their outer edges lying at an inclined angle tapering to said smaller diameter circular top and serving to define a plurality of sections being joined together at their inner vertical edges in right angle relation to define a sector-shaped section and wherein the partitions are arranged parallel in pairs with each pair providing opposite sides of a substantially rectangular section with each partition of a parallel pair in association with the confronting partition of the next adjoining parallel pair providing the opposite sides of one of said sector-shaped sections, and wherein the lower edge of each vertical partition fits between a pair of the narrowly spaced side flanges of an adjacent rectangular and truncated sector shape base surfacing member and is secured thereto.

3,856,371
KNOCK-DOWN DESK CONSTRUCTION

James M. Forsyth, Pocopson, Pa., assignor to General Metalcraft, Inc., Jenkintown, Pa.

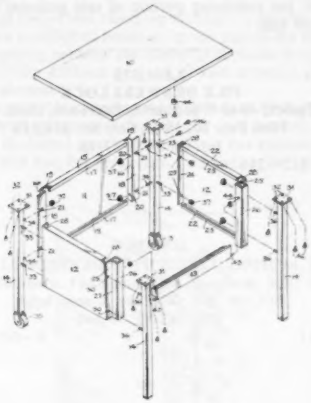
Filed Oct. 17, 1973, Ser. No. 407,211
Int. Cl. A47b 13/06, 17/06
U.S. Cl. 312—195 10 Claims

1. A knock-down construction of a supporting understructure for the top of a table or the like comprising in combination,

a. a pair of vertically extending side panels disposed in laterally spaced, parallel relation, each side panel having at its rear end a vertically extending inturned flange and at its front end a vertically extending flange bent upon itself to provide a frontally projecting box-like section inwardly offset from the panel to provide a right angular space or seat extending along the full vertical length of the panel for accommodating therein a vertically extending front leg for the table,

b. a vertically disposed back panel extending transversely between the rear ends of said side panels, said back panel being provided at each of its opposite ends with a vertically extending right-angular flange having a terminal branch of which extends freely beyond the end of and is disposed in inwardly spaced parallel relation to said back panel to provide at each said end of said panel a right angular vertically extending space or seat in oppositely facing relation to the space or seat provided at the front end of the adjoining side panel for accommodating therein a vertically extending rear leg for the table,

c. a plurality of vertically extending post members or legs of square cross section respectively nested in the vertically extending right-angular spaces or seats provided in the opposite ends of said back panel and the front ends of said side panels, and

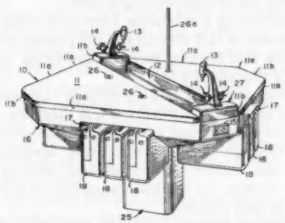


d. means for rigidly securing said side panels and said back panel to said posts or legs with said rear end flanges of said side panels respectively overlapping said freely extending terminal branches of the end flanges of said back panel and with said posts held secured against rotation about their vertical axes.

3,856,372
LABORATORY WORKING SINK STATION

Arthur W. Carlson, Muskegon, and Leif Blodee, Holland, both of Mich., assignors to E. H. Sheldon and Company, Muskegon, Mich.

Continuation-in-part of Ser. No. 135,608, April 20, 1971, abandoned. This application Dec. 6, 1972, Ser. No. 312,611
Int. Cl. B01l 9/02
U.S. Cl. 312—209 10 Claims



1. A laboratory table structure comprising: a fixed hollow pedestal for routing plumbing and electrical supply lines and having upright side walls; an access panel in one of said side walls of said pedestal; means for securing said pedestal to a floor; an upwardly concave plastic hull providing an enlarged central aperture at its bottom to receive said pedestal and having upwardly-extending peripheral side walls; a plurality of said side walls of said hull defining recesses for supporting storage means; a table top having a polygonal plan shape with four relatively long sides extending along the edges of a square

and four relatively short sides extending between adjacent ones of said long sides, said table top providing a trough opening elongated diagonally of said square; a trough beneath said trough opening accessible from the top of said table; link means for securing said table top to said hull; and vertically adjustable flange means on the exterior of said pedestal for supporting and securing said hull to said pedestal at one of a plurality of vertically spaced locations on said pedestal to adjust the height of said hull, top, trough and storage means as a unit, the remaining portion of said pedestal extending within said hull.

3,856,373

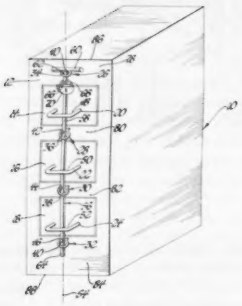
FILE DRAWERS LOCK

Paul J. Tucich, 4645 Woodworth, Dearborn, Mich. 48126

Filed Feb. 20, 1973, Ser. No. 334,010

Int. Cl. E05b *65/46*

U.S. Cl. 312—216 **6 Claims**



1. In a cabinet containing tiers of file drawers operable to move in a horizontal direction with respect to the cabinet, the improvements comprising:

a rod having a thickness and depending in a vertical direction across the face of the cabinet and the face of the drawers therein;

a member surrounding said vertical rod near the top thereof and being fixed to the cabinet and limiting the horizontal translation of said rod with respect to said cabinet;

a cross bar member having a thickness of an order of magnitude corresponding to the thickness of said vertical rod and being rigidly attached to the top of said rod and resting on top of said limiting member;

an aperture having a maximum horizontal width less than the thickness of said vertical rod and passing through said rod below said limiting member and being operable to receive a shackle of a lock;

a lock having a shackle passing through said aperture and said shackle having a thickness less than said maximum horizontal width of said aperture, and said shackle, when passed through said aperture, being operable to abut against the bottom surface of said limiting member thereby limiting the vertical translation of said rod with respect to said cabinet;

another member limiting horizontal translation of said rod with respect to said cabinet and being fixed to said cabinet and being spaced at a distance from said first mentioned limiting member;

said another limiting member having a portion surrounding said vertical rod member having a thickness of the same order of magnitude as the thickness of said shackle and a part of said portion being juxtaposed between said vertical rod member and the face of said cabinet;

whereby said rod, lock and limiting members cooperate to limit the translation of the drawers with respect to said cabinet.

3,856,374

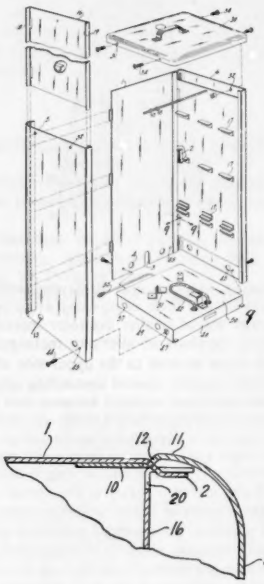
KNOCK-DOWN ELECTRIC FOOD SMOKER

Jack P. Christen, Onalaska, Wis., assignor to Outers Laboratories, Inc., Onalaska, Wis.

Filed Mar. 18, 1974, Ser. No. 452,566

Int. Cl. A47b *47/00*

U.S. Cl. 312—263 **1 Claim**



1. Sheet metal panels construction for a knock-down electric food smoker cabinet comprising, two vertical side panels each having a flange extending at right angles and located along the rear edge of each panel, slots located in said flanges, an interior baffle plate located in parallelism along the inside of each of said side panels, said baffle plates having slots which are alignable with said slots in said side panels, a vertical rear panel having tabs extending outwardly from each of its sides and which tabs are inserted in said aligned slots of said baffles and side panels to thereby rigidly hold said baffle plates, said side panels and said rear panel together in assembled relationship.

3,856,375

MULTIPLE PLUG DEVICE

Heinz Muench, Geretsried, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 13, 1972, Ser. No. 271,403

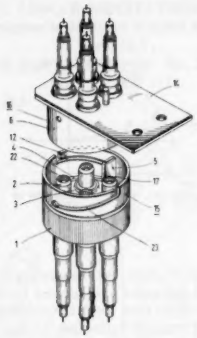
Claims priority, application Germany, July 19, 1971, 2136022

Int. Cl. H01r *13/54, 13/64*

U.S. Cl. 339—31 R **6 Claims**

1. A multiple connector comprising a first plug part and a second plug part each comprising a respective plurality of contact elements which cooperably engage the other plurality of contact elements when said plug parts are mated, each of said pluralities of contact elements fixed in a pattern defining the corners of a polygon which permits at least two different engagment associations of the pluralities of contact elements, first and second protective collars included in the respective plug parts surrounding the contact elements thereof and di-

mensioned for telescopic movement of said second protective collar into said first protective collar upon mating of the plug parts, first and second cooperable guide means for the respective plug parts for aligning and guiding said parts, said first guide means rigidly connected with said first plug part, second guide means included in said second collar, said first protective collar being rotatably mounted on said first plug part



about an axis of said first plug part extending in the direction of plugging, and means for selectively securing said second protective collar to said second plug part at a number of circumferentially distributed positions, the number of positions determined as at least an integer fraction of the number of possible associations of said pluralities of said contact elements.

3,856,376

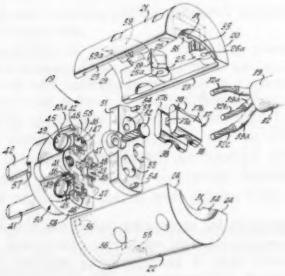
ELECTRICAL CONNECTOR

John M. Poliak, East Meadow; Milton J. Weitzman, Bayside, and Juan M. Lopez, New York, all of N.Y., assignors to Leviton Manufacturing Co., Inc., Brooklyn, N.Y.

Continuation of Ser. No. 30,143, April 20, 1970, abandoned. This application Apr. 27, 1972, Ser. No. 248,030

Int. Cl. H01r *13/58*

U.S. Cl. 339—107 **23 Claims**



1. In an electrical connector for attachment to the end of an electrical cable, the improvement which comprises:

a. a split body formed of an insulating material;

b. said body being split along its longitudinal axis into two complementary parts and having an opening at a rear end thereof to receive an electrical cable;

c. said two parts of the body having opposing surfaces adapted to be brought into engagement with each other;

d. fastening means located along opposite sides of said body for securing the two parts of the body together; and

e. strain-relief means carried by and located within said body adjacent the opening in the rear end thereof for engagement with the cable received therein;

f. said relief means exerting a predetermined clamping force on the cable when the two parts of the body are brought into engagement; wherein:

g. the strain-relief means includes cable-clamping members carried by the two parts of the split body;

h. said cable-clamping members having opposing spaced surfaces for receiving and clamping a cable therebetween;

i. at least one of said clamping members is capable of being placed in different positions in one part of the body with the spacing between the clamping surfaces of said members being different in each of said different positions; and wherein:

j. said one cable clamping member has an H-shape having legs with clamping surfaces at the ends thereof;

k. said H-shaped member including a bar connecting said legs with said bar being offset relative to the ends of the legs.

3,856,377

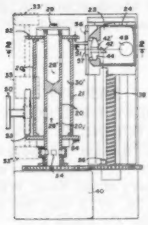
OPTICAL SCANNER WITH SINGLE OPTICAL HEAD

Ernest Wildhaber, 124 Summit Dr., Brighton, N.Y. 14620

Filed June 4, 1973, Ser. No. 366,775

Int. Cl. G02b *17/00*

U.S. Cl. 350—6 **11 Claims**



1. The method of optically scanning records bearing characters arranged in distinct parallel lines, which comprises

providing an optical head and a rotor containing a cylindrical surface coaxial with its axis of rotation,

effecting turning motion of said rotor on its axis,

wrapping a record sheet on said cylindrical surface, with the character lines extending approximately in the direction of the rotor periphery, by first attaching the leading record side thereto, pressing the record onto said cylindrical surface as the rotor turns, without further attaching it, and attaching the trailing record side thereto as wrapping nears completion,

lighting the record through said optical head,

effecting feed motion between said head and rotor axially of the rotor in time with the turning motion of said rotor, for scanning the character lines of the record,

gathering light reflected from a small lighted area of the record and directing it to means adapted to produce variations in electric current in accordance with the light variations received,

reversing said turning and feed motions after scanning to return to starting position at increased speed, and

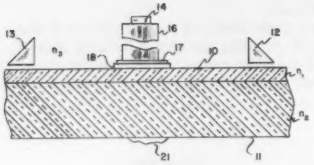
releasing first the former trailing side of the record from the cylindrical surface after reversal and later releasing the opposite side as the record becomes unwrapped.

3,856,378

METHOD AND MEANS FOR MODULATING LIGHT PROPAGATING IN AN OPTICAL WAVEGUIDE BY BULK ACOUSTIC WAVES

Gerald B. Brandt, and Milton Gottlieb, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 28, 1973, Ser. No. 336,864
Int. Cl. G02b 5/14; G02f 1/24
U.S. Cl. 350—96 WG 11 Claims



1. A method for modulating light propagated through an optical waveguide comprising:

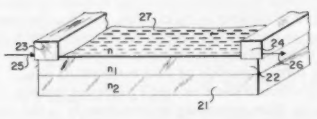
passing ultrasonic acoustic bulk waves through said waveguide substantially perpendicular to the plane of the waveguide and to the direction of light propagation for interaction with said propagated light.

3,856,379

OPTICAL MIXING DEVICE EMPLOYING NONCRITICAL PHASE MATCHING IN WAVEGUIDES

William K. Burns, and Ronald A. Andrews, both of Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 20, 1973, Ser. No. 389,750
Int. Cl. G02b 5/14
U.S. Cl. 350—96 WG 10 Claims



1. A substantially symmetric optical waveguide which for noncritical phase matching comprises:

an optically transparent dielectric material substrate of substantially uniform thickness;

a high index dielectric film supported by said substrate, and an index of refraction tunable liquid supported upon and overlying said dielectric film;

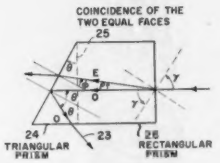
said dielectric film having an index of refraction greater than said substrate and said liquid an input optical coupler on one end of said waveguide for coupling radiation into said waveguide, an output optical coupler on the opposite end of said waveguide for coupling radiation out of said waveguide, whereby radiation coupled into and out of said symmetrical waveguide is phase matched by tuning said liquid.

3,856,380

PRISM TO SEPARATE A SECOND HARMONIC FROM ITS FUNDAMENTAL FREQUENCY

Kamala S. Krishnan, Palo Alto, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 15, 1973, Ser. No. 360,500
Int. Cl. G02b 1/24
U.S. Cl. 350—157 5 Claims



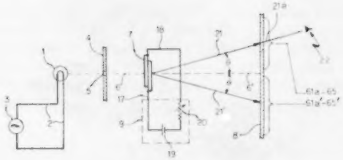
1. A single-section prism for separating light impinging thereon into its fundamental and second harmonic frequencies, said prism being formed from a birefringement material and providing total internal reflection of one frequency and total transmission of the other frequency at its Brewster's angle by properly orienting the crystal and properly selecting said crystal's geometry a light beam incident on one face of said crystal being separated into its ordinary and extraordinary rays as it travels through said crystal, said extraordinary ray being incident on the back face of said crystal at its Brewster angle so that it is totally transmitted while said orindary ray is almost totally reflected.

3,856,381

VOLTAGE-CONTROLLED DISPERSION OF LIGHT BY LIQUID CRYSTALS

Clarence L. Hedman, Jr., Campbell; Karl-Dieter S. Myrenne, Los Altos Hills, and Perry H. Vartanian, Jr., Woodside, all of Calif., assignors to SCM Corporation, New York, N.Y.

Division of Ser. No. 242,709, April 10, 1972, Pat. No. 3,758,195. This application Aug. 22, 1973, Ser. No. 390,461
Int. Cl. G02f 1/16
U.S. Cl. 350—160 LC 7 Claims



1. In apparatus for separating polychromatic light into its spectral components, said apparatus comprising a source of polychromatic light, a beam-defining member cooperating with said source, a dispersion member aligned with the beam, and a viewing station for the dispersed light, said viewing station having portions non-aligned with said beams and said dispersion member being located between said beam-defining member and said viewing station, the improvement wherein said dispersion member comprises:

a cell having walls transparent to said light,

a mesomorphic material in said cell, said mesomorphic material having light-dispersion characteristics when subjected to a field of particular magnitude, said dispersion comprising formation of a plurality of spectra, displaced angularly from said beam and onto non-aligned portions of said viewing station,

means to generate a field of variable magnitude greater than said particular magnitude, and

means to subject said mesomorphic material to said variable field, said spectra being displaced in an amount dependent upon the magnitude of said field.

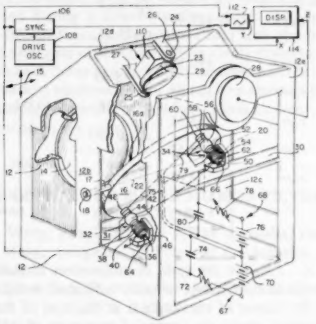
3,856,382

BALLISTIC LINEAR BIDIRECTIONAL SCANNER SYSTEM, assignor to Midland Capital Corporation, New York, N.Y.

Filed June 12, 1972, Ser. No. 261,727

Int. Cl. G02f *1/34*

U.S. Cl. 350—285 **7 Claims**



1. A linear scanning system operative to bidirectionally scan radiation incident on said system over a field of view and comprising:

means for redirecting radiation received from said field of view;

means for supporting said redirecting means for ballistic rotation about an axis through a rotational angle and providing a low frictional restraint to rotation of said redirecting means, whereby the ballistic rotation rate of said redirecting means is generally maintained through said rotation angle;

a rotation cycle being defined as two complete traversals through said rotation angle in opposed directions by said redirecting means;

an electromagnetic transducer including plunger means disposed at at least one angular limit of said rotation angle to contact said redirecting means at said at least one limit and operative to reverse the rotation of said redirecting means by applying a torque impulse to said redirecting means during contact therewith over a time interval which is a small fraction of the rotation cycle of said redirecting means, thereby to provide ballistic scanning by said redirecting means over substantially all of said rotation cycle;

first and second electrical contacts mounted on a reverse surface of said redirecting means and positioned along a line orthogonal to said axis;

said plunger means comprising:

first and second electrical coils having the respective axes thereof generally directed toward said first and second electrical contacts;

first and second plungers slidably mounted within said first and second electrical coils respectively;

said plungers being responsive to the application of electrical excitation to said coils to cause said plungers to be impelled toward said first and second contacts;

third and fourth contacts respectively secured to said first and second plungers on ends which respectively confront said first and second contacts, whereby said third and fourth contacts are operative to alternately contact said first and second contacts during oscillation of said redirecting means;

said electromagnetic transducer including:

first means for applying electrical excitation to said first coil in response to electrical contact between said first and third contacts thereby to cause rotation of said redirecting means away from said first coil toward said second coil; and

second means for applying electrical excitation to said second coil in response to electrical contact between said second and fourth contacts thereby to cause rotation of said redirecting means away from said second coil toward said first coil.

3,856,383

REAR VISION MIRROR APPARATUS FOR AUTOMOBILE

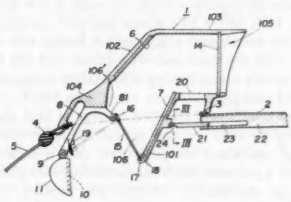
Makoto Yamashita, Sagamihara; Kenkichi Ikura, Yokohama, and Masagoro Kushida, Isehara, all of Japan, assignors to Ichika Industries Limited, Tokyo, Japan

Filed Sept. 25, 1972, Ser. No. 291,624

Claims priority, application Japan, Oct. 1, 1971, 46-90036

Int. Cl. G02b *5/08*

U.S. Cl. 350—302 **4 Claims**

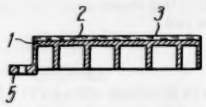


1. A rear vision mirror apparatus of the periscope type to provide a rear field of vision via the roof top of an automobile, comprising: a cylindrical housing fixed to the roof top and having an open rear end sealed tightly by a transparent cover and also having a front lower portion opening into the driver's chamber at a position close to the front window pane of the automobile; an objective mirror and a reflecting mirror operatively arranged in said housing; and an eye-piece mirror pivotably secured below said open front lower portion, the lowermost end part of the housing located in the immediate foreground of said transparent cover being provided with a rearward open portion communicating with the driver's chamber, and of sufficient size for a person to manually clean said transparent cover, said open front lower portion and said rearward open portion cooperatively forming a passageway for heated air from a defroster, the heated air passing into the housing through said lower front portion thereby preventing frost from forming on said transparent cover, and returning to the interior of said automobile through said rearward open portion; a movable cover member mounted within said rearward open portion and adapted for blocking said passageway and terminating the flow of heated air when the rear field of vision may be clearly viewed through said transparent cover, the portion of the device applied to the inner surface of the roof of the automobile forming a space for the accommodation of said cover member, said cover member being slidably insertable within said space so that, by sliding this cover member, the rearward open portion may be blocked and unblocked; a light attrition filter and a stay for pivotally securing said eyepiece mirror to the housing, said stay having a branched arm to provide a support for the light-attrition filter, one end of said filter being pin-hinged to said support, whereby said filter may assume a selected position between a position transverse to the optical path leading from the reflecting mirror to the eye-piece mirror and a position out of line of said optical path.

3,856,384
OPTICAL MIRROR

Iosif Ivanovich Kryzhanovsky, Krasnaya ulitsa, 20, kv. 6, Leningrad, U.S.S.R.

Continuation of Ser. No. 71,612, Sept. 11, 1970, abandoned. This application Mar. 16, 1973, Ser. No. 342,319
Int. Cl. G02b 5/08
U.S. Cl. 350—310 2 Claims

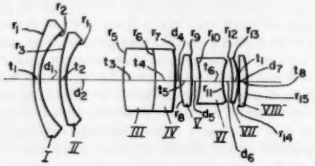


1. A light-weight optical mirror, suitable for high-speed scanning systems, comprising the combination of a thin glass layer not exceeding 6 millimeters in thickness, with a carrier base made of a refractory metal with a low specific weight between 1.86 and 4.507 grams per cm^3, constituting a rigid frame onto which said glass layer is baked and with which it is fused, with the exclusion of a frame and the like member; said refractory metal having a softening temperature exceeding that of said glass layer by more than 100°C, and a thermal expansion coefficient so close to that of said glass layer that deforming stresses do not appear therebetween within the region of operating temperatures; and a reflecting coating applied to a polished external surface of said glass layer, combining high mechanical strength and rigidity, as inherent in said refractory metal, with excellent thermal resistance and impact strength, as imparted by said reflecting coating to the resulting combination of said metal base and said glass layer.

3,856,385
WIDE-ANGLE LENS ASSEMBLY OF RETROFOCUS TYPE

Yasuo Takahashi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Apr. 25, 1973, Ser. No. 354,198
Claims priority, application Japan, May 1, 1972, 47-43506
Int. Cl. G02b 9/00, 1/00
U.S. Cl. 350—214 1 Claim



1. In a wide-angle retrofocus type of objective having eight lenses I-VIII wherein lenses III and IV are cemented together and have a common surface whose radius of curvature is r_6, said objective having for a focal length F of 100 mm, the following data:

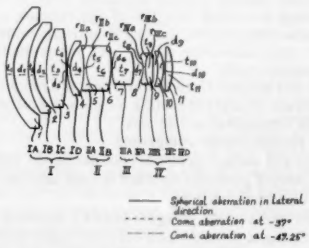
Lens		F = 100 mm		Glass n	Constants ν
	r_1 =	+160.34			
I			t_1= 6.94	1.51633	64.1
	r_2 =	+78.42			
			d_1=22.55		
	r_3 =	+187.33			
II			t_2= 6.94	1.58913	61.1
	r_4 =	+81.33			
			d_2=62.44		
	r_5 =	+242.83			
III			t_3=34.69	1.62004	36.3
	r_6 =	−242.83			
IV			t_4=24.28	1.51633	64.1
	r_7 =	−222.49			
			d_4= 5.20		
	r_8 =	+103.19			
V			t_5=11.45	1.81554	44.5
	r_9 =	−261.91			
			d_5= 8.67		
	r_{10}=	−122.46			
			t_6=27.75	1.80518	25.4
VI					
	r_{11}=	+90.19			
			d_6 = 8.60		
	r_{12}=	−109.64			
VII			t_7= 7.28	1.69350	50.8
	r_{13}=	−68.62			
			d_7= 0.49		
	r_{14}=	−648.62			
VIII			t_8= 8.67	1.71300	54.0
	r_{15}=	−118.08			
		$F_{1\ 2}$	= − 132.3	÷ − F/0.756	
		$F_{1\ 2\ 3\ 4}$	= +1135.9	÷ F/0.088	
		F_B	= 12.95F		

where r_1..... r_{15} are the radii in millimeters of the successive lens surfaces from front to rear, indicated as being positive where the center of curvature is at the rear of the objective and negative where the center of curvature is at the front of the objective, with the radius r_6 being common to the cemented surfaces of lenses III and IV, the thicknesses t_1–t_8 of the lenses I–VIII, respectively, also being in millimeters, with the distances d_1–d_7 between the successive lenses also being in millimeters, the glass constants n being the d-line refractive index of the successive lenses and ν being the Abbe numbers of the successive lenses, while F_B is the back focus, and $F_{1\ 2}$ and $F_{1\ 2\ 3\ 4}$ are respectively the composite focal lengths of the first two and first four lenses.

3,856,386
EXTRAWIDE-ANGLE RETROFOCUS TYPE OF OBJECTIVE

Yoshisato Fujioka, Tokyo, Japan, assignor to Kabushiki Kaisha Yashica, Tokyo-to, Japan

Filed May 8, 1973, Ser. No. 358,266
Claims priority, application Japan, May 9, 1972, 47-45044
Int. Cl. G02b 9/64
U.S. Cl. 350—214 9 Claims



1. An extrawide-angle retrofocus objective having four lens element sections the first of which is situated at the front of the objective nearest to the object to be photographed and has a divergent effect, said first lens element section consisting of four elements arranged with air gaps respectively situated therebetween and the first, second and fourth of said elements

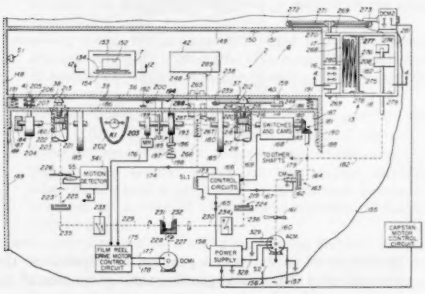
of said first section, considered in the direction from the front toward the rear, being negative meniscus lenses respectively having convex surfaces directed forwardly toward the object, while the third of said four elements is a positive lens element, the second of said four lens element sections being situated behind the first, having an extremely weak refractive power in its entirety and including at least two but not more than three lens elements the first of which is nearest to the object and has a concave surface which is directed forward toward the object, the third of said lens element sections being situated behind the second and forming a positive lens system including at least one but not more than two lens elements, and the fourth of said lens element sections being situated behind the third and including from the front toward the rear a negative biconcave lens element, a positive lens having a convex surface of large curvature directed toward the object, a positive meniscus lens having a convex surface directed rearwardly toward the image plane, and a positive rear lens, the first and second lens elements of said fourth lens element section being cemented to each other at a forwardly directed convex surface of the second lens element of said fourth lens element section, and the remaining elements of said fourth lens element section being separated by air gaps.

3,856,387

SOUND EDITOR FOR SOUND MOTION PICTURE PROJECTOR

William R. Wray, Brookline, and Joseph A. Stella, Peabody, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed June 28, 1973, Ser. No. 374,700
Int. Cl. G03b *31/00*
U.S. Cl. 352—5 **11 Claims**



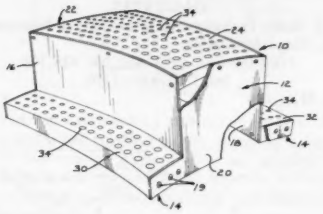
1. Sound editing and reviewing apparatus for a sound motion picture producing system comprising a housing adapted to receive a cassette containing a strip of motion picture film bearing a sound track, a viewing screen mounted on said housing, a loudspeaker, a microphone, a control button, means mounting said first control button for movement between first and second positions, a second control button, means mounting said second control button for movement between first and second positions, control means in said housing engageable with the film in a cassette received by said housing for sequentially transporting the film through a sequence of movements comprising an advance movement and a return movement, a servomechanism engaged with the film during said advance movement for moving a portion of the film past a sound station at a uniform speed determined by the average speed of said advance, a sound transducer, means for engaging said transducer with the sound track on the film when said servomechanism is engaged with the film, means actuated by said control means for projecting images on the film onto said viewing screen during said advance movement, first interrupting means actuated by said first control button in its second position and effective during said advance movement for interrupting said advance movement and starting said return movement, second interrupting means actuated by said first control button when returned from its second position to its first position for interrupting said return movement and resuming said advance movement, means actuated by said second control button in its second position during said advance movement for connecting said microphone to said transducer, and means actuated by said second control button in its first position for connecting said transducer to said loudspeaker.

3,856,388

OUTDOOR DRIVE-IN THEATER

Reat R. Younger, Springfield, Mo., assignor to United States T.R.A.D. Corporation, Springfield, Mo.

Filed July 19, 1973, Ser. No. 380,708
Int. Cl. G03b *21/32*
U.S. Cl. 352—40 **2 Claims**



1. An apparatus for projecting a plurality of images from a projected image onto at least two spaced groups of discrete viewing surfaces, said apparatus comprising

a projector means for projecting an image,

a first group of lens means, said first group being positioned to receive said projected image and to convert said projected image into discrete images for focusing on one group of said viewing surfaces,

a second group of lens means, said second group being positioned to receive said projected image and to convert said projected image into discrete images for focusing on the other group of said viewing surfaces, and

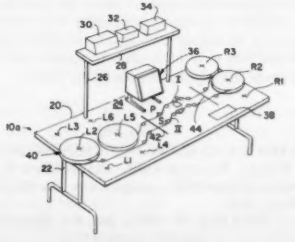
a cluster board having at least two surfaces spaced from one another and from said projector means, one of said board surfaces operable to support said first group of lens means, the other of said board surfaces operable to support said second group of lens means, the distance separating said board surfaces corresponding to the differences between said focal lengths of said lens groups.

3,856,389

HORIZONTAL FILM EDITING TABLE

Rodney D. Gardner, 2807 St. Paul St., Baltimore, Md. 21218

Filed Apr. 30, 1974, Ser. No. 465,473
Int. Cl. G03b *21/00*
U.S. Cl. 352—129 **12 Claims**



1. A film editing machine comprising: a film transport, including: a plurality of spindle assemblies, means rotatably

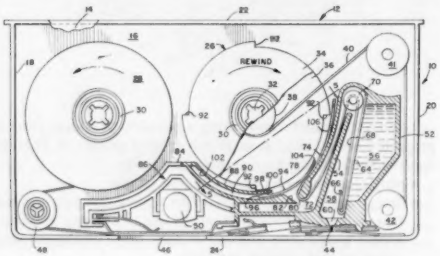
supporting said plurality of spindle assemblies vertically oriented in series-parallel-spaced relation, each spindle assembly including an upper spindle and a lower spindle co-axially aligned therewith, means for selectively retarding rotation of each of said upper spindles, means for releasibly connecting each upper spindle with the respective lower spindle co-axially aligned therewith, means for coupling in rotation all said lower spindles, a synchronous speed motor, means for releasibly connecting the synchronous speed motor with a first said lower spindle, a variable speed motor, means for releasibly connecting the variable speed motor with a second said lower spindle; means for manually grasping each of said upper spindles, and a film sprocket proximately below each said grasping means.

3,856,390

PULL-STRIP MECHANISM FOR MULTIPURPOSE FILM CASSETTES

Joseph A. Stella, Peabody, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 26, 1973, Ser. No. 428,376
Int. Cl. G03c *11/00*
U.S. Cl. 352—130 **17 Claims**



1. In a multipurpose film cassette of the type containing for exposure and processing a strip of photographic film connected at opposite ends to supply and take-up spools, processing means also contained in the cassette and including a supply of processing fluid initially sealed by a releaseable tear-tab closure to be removed after film strip exposure for deposition of the processing fluid on the film strip during rewind movement thereof from the take-up spool to the supply spool, the film strip having an aperture near the end thereof connected to the supply spool to receive and latchingly engage the free end of a resilient pull strip joined at its other end to the tear-tab closure, the improvement comprising:

movable keeper means for holding the free end portion of the pull-strip out of contact with the film strip during passage thereof from the supply spool to the take-up spool during exposure; and

means for moving said keeper means away from the free end portion of the pull-strip to an inoperative position after exposure, thereby to allow the free end portion of the pull-strip to spring resiliently into contact with the film strip to engage the aperture therein and be pulled with the film strip on rewind to remove the tear-tab closure from the supply of processing fluid.

3,856,391

SLIDE TRAY AND SLIDE POSITIONING MECHANISM

Roy E. Hickey, Honeoye Falls, and William R. Sanderson, Rochester, both of N.Y., assignors to The Singer Company, New York, N.Y.

Filed May 29, 1973, Ser. No. 364,470
Int. Cl. G03b *21/14*
U.S. Cl. 353—88 **24 Claims**

1. Apparatus for projecting slides comprising:

a slide projector;

a slide tray, including a plurality of indexing pins depending therefrom, removably mounted on said projector and adapted to contain a plurality of slides for projection by said projector;

said projector including:

a gate;

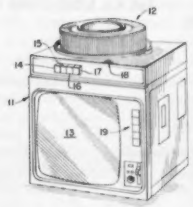
said gate including a shutter member rotatably mounted near one end thereof along an axis in a plane substantially normal to the optical path of said projector;

said shutter having a first position blocking the optical path of said projector and a second position for which the optical path of the said projector is not blocked;

indexing means adapted to rotate said slide tray relative to said gate for successively bringing slides in said slide tray, one at a time, into substantially vertical register with said projector gate; and

first means operating in time relation with said indexing means for successively feeding said slides substantially vertically from said tray into said gate under the influence of gravity, for projection, and from said gate substantially vertically back into said tray;

second means in time relation with said indexing means for causing said shutter to be in its first position in response to the absence of a slide in said gate and for causing said



shutter to be in its second position in response to the presence of a slide in said gate to enable projection of the image on said slide;

said second means including:

means biasing said shutter in said second position;

means in time relation with said indexing means for rotating said shutter around said rotational axis to said first position in opposition to said biasing means and for enabling counter-rotation of said shutter around said rotational axis to said second position under the urging of said biasing means; and

means for sensing the absence of a slide in said gate for latching said means for rotating said shutter in a position wherein said shutter is at said first position and for enabling the return of said shutter to said second position when a slide is in said gate;

said indexing means including:

a driven indexing bar having a slide tray indexing element at one end thereof;

pivoted means coupled to said indexing bar for guiding said indexing element to a position between two adjacent pins depending from said slide tray and then rotating said indexing bar around the pivot of said pivoted means to rotate said slide tray; and

means for disabling said driven indexing bar to prevent indexing of said slide tray by said indexing means.

3,856,392
AUTOMATIC LENS FOCUSING METHOD AND APPARATUS

William J. Harrison, San Rafael, Calif., assignor to Photoidetics, Inc., San Francisco, Calif.

Division of Ser. No. 117,815, Feb. 22, 1971, Pat. No. 3,732,001, which is a continuation of Ser. No. 691,405, Dec. 18, 1967, abandoned. This application Nov. 30, 1972, Ser. No. 310,750

Int. Cl. G03b *3/00, 21/14*

U.S. Cl. 353—101 **5 Claims**

1. A slide projector with automatic lens focusing comprising:

first lens means for projecting a first image of a slide transparency;

a screen spaced from said first lens means for receiving the projected first image;

second lens means spaced from said screen and positioned to form a second image of a portion of the first image projected on said screen;

an image motion detector spaced from said second lens means in a position to receive the second image formed by said second lens means, said motion detector designed to generate a signal in response to motion of the image formed thereon;

masking means mounted adjacent said first lens means in the aperture area of said first lens means in a position to interrupt a portion of the light passing through said lens means onto said screen;

means for moving said masking means in the aperture area of said first lens means to cause motion of the out-of-focus portions of the first formed image on the screen and thereby the second image on the motion detector, whereby a signal is generated at the motion detector in response to motion of out-of-focus portions of the first formed image;

and control means controlling the relative distance between said first lens means and said slide transparency and activated by said generated signal to provide optimum focusing of the first formed image on the screen.

3,856,393
OPENING DEVICE FOR AN ELECTRONIC SHUTTER

Masuo Ogihara, and Masanori Watanabe, both of Chiba, Japan, assignors to Seiko Koki Kabushiki Kaisha, Tokyo, Japan

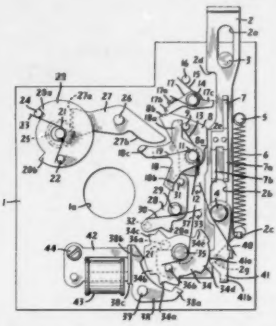
Filed May 29, 1973, Ser. No. 364,237

Claims priority, application Japan, May 26, 1972, 47-52309

Int. Cl. G03b *9/62*

U.S. Cl. 354—258 **4 Claims**

1. In a camera having an electric shutter movable from a closed state to an open state and back to said closed state to effect an exposure: opening means for opening said shutter to initiate an exposure comprising an opening member having one position corresponding to that wherein said shutter is closed and turnable in one direction from said one position to effect opening of said shutter, means for releasably locking said opening member in said one position, first biasing means biasing said opening member in said one direction with a first biasing force sufficient to effect turning of said opening member in said one direction when said opening member is unlocked to thereby effect opening of said shutter, and retarding means engageable with said opening member, means for spacing said retarding means from said opening member with a predetermined distance when the opening member is in said one position so that said opening member is started without relation with said retarding means when said opening member



is unlocked and said opening member is engaged with said retarding means and retarded by said retarding means during moving of said opening member when said opening member moves through said predetermined distance from said one position, and closing means for closing said shutter to complete said exposure.

3,856,394
FILM HOLDING ARRANGEMENT FOR PHOTOSETTING MACHINE

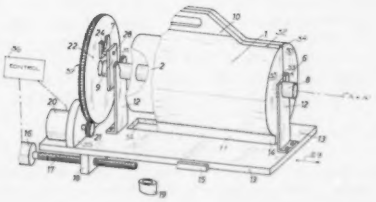
Hans Linde, Berlin, Germany, assignor to Firma H. Berthold AG, Berlin, Germany

Filed Sept. 10, 1973, Ser. No. 396,050

Claims priority, application Germany, Oct. 5, 1972, 2249197

Int. Cl. B41b *21/32*

U.S. Cl. 354—275 **10 Claims**



1. A film holding arrangement for a photosetting machine or the like, said arrangement comprising:

a support;

a shell on said support and formed with a window;

a film-carrying drum received in and surrounded by said shell while being rotatable relative thereto;

at least one blocking element attached to said drum over an end of a piece of film adapted to receive light through said window;

spring means between said drum and said shell for urging said shell and drum into a relative position in which said element prevents light entering said shell through said window from falling on said film;

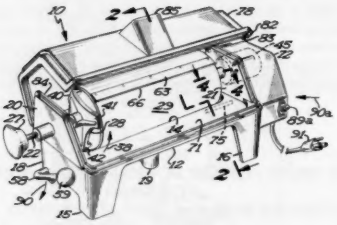
mounting means on said support including a seat for releasably supporting said shell; and

means on said support and on said drum for relatively angularly displacing said shell and said drum to shift element out of said position when said shell is supported on said seat.

3,856,395
COLOR PHOTO PROCESSING APPARATUS

Alfred E. Comstock, Frontenac, Minn. 55026

Filed Feb. 15, 1973, Ser. No. 332,670
Int. Cl. G03d *13/00*
U.S. Cl. 354—299 4 Claims



1. A photographic processing apparatus for chemically processing photographic material with processing liquid comprising:

a processing receptacle adapted to contain a predetermined amount of processing liquid therein and including a trough in said receptacle to contain the processing liquid; a cover member on said receptacle and movable relative thereto between open and closed positions, said cover member when in the closed position engaging said processing receptacle in light-sealing relationship therewith and defining a processing chamber above said trough;

a cylinder adapted to retain photographic material;

a rotatable cylinder engaging mechanism in the chamber releasably engaging said cylinder so that a part of the periphery of the cylinder will extend into liquid in the said trough, the mechanism including drive means for rotating said cylinder;

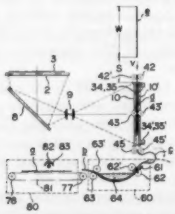
a funnelled aperture through said cover member with cooperating baffles therealong to guide the liquid through the aperture and to exclude light from entering the chamber through the aperture; and

said receptacle further including a distribution ledge for processing liquid, the ledge being inclined downwardly toward said trough and lying in the chamber along and adjacent the trough and directly beneath said funnelled aperture so that said aperture discharges liquid onto said ledge for distribution into and along said trough.

3,856,396
ELECTRONIC PHOTOCOPYING MACHINE

Teizo Kushima; Susumu Tanaka, and Masaya Ogawa, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 543,226, April 18, 1966, Pat. No. 3,690,759. This application July 11, 1972, Ser. No. 270,831
Int. Cl. G03g *15/22*
U.S. Cl. 355—10 4 Claims

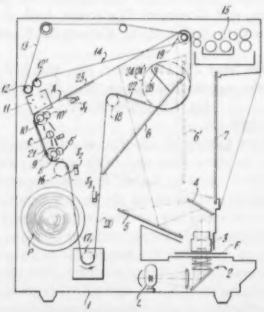


1. An electronic photcopying machine comprising a magazine containing a plurality of papers stacked therein each of which papers is coated with a photoconductive insulator on one side; a first feeding mechanism for feeding said papers sequentially from said magazine at predetermined intervals; means for providing electrostatic charges to the photoconductive insulator on the thusly fed paper so as to impart a photosensitive property thereto; a second feeding mechanism for introducing the thusly photosensitized paper to a predetermined exposure position; an exposure frame including driven rollers and a transparent plate at said exposure position, said second feeding mechanism including a pivotal assembly which comprises a plurality of driving rollers, a motor to drive said driving rollers, and a hooked lever means having a lever member with a notch adapted for engaging a fixed pin to secure the pivotal assembly in a predetermined position with respect to said exposure frame, in which position a predetermined space is provided between the assembly and transparent plate for passage of photosensitive paper and said driving rollers oppose the driven rollers for feeding the paper through said space; a lamp means for illuminating an object to be copied; an optical system for projecting an image of the object onto the paper at the exposure position, said first and second feeding mechanisms including feeding means which are inoperative for a predetermined period for effecting exposure and operative subsequently to transfer the thusly exposed paper; a developing means to develop the image on the photosensitive paper; a drying means to fix the image thereon; a third feeding mechanism for feeding the exposed photosensitive paper through the developing means and drying means at a relatively lower feeding velocity than those of the other feeding mechanisms, said third feeding mechanism including opposed driving and driven rollers disposed at the entrance to the developing means and relatively positioned with respect to the second feeding mechanism to receive the exposed paper therefrom so that by virtue of the lower feeding velocity of the third feeding means the paper is formed with a temporary loop at the entrance to the developing means; said velocity of the rollers of the third feeding mechanism being sufficiently fast so that a succeeding photosensitive paper does not overlap the photosensitive paper entering the developing means; and an endless belt means wound on at least two of said driving rollers and advancing in contact with the driven rollers for advancing the paper therewith.

3,856,397
VIEWING AND ELECTROSTATIC COPYING MACHINE

Hidenori Suzuki, Kawasaki; Katsumi Maeda; Keiji Nakatani, both of Tokyo, and Kenjiro Ishii, Yokohama, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed July 12, 1973, Ser. No. 378,746
Claims priority, application Japan, July 19, 1972, 47-85538[U]
Int. Cl. G03b *13/28*
U.S. Cl. 355—45 6 Claims



1. A viewing and electrostatic copying machine comprising a viewing section, an electrostatic copying section including

an electrostatic charging means, an electrostatic image developing means and means for advancing copy paper from said charging means along an image focal plane to said developing means, means including a mirror moveable between a retracted and an advanced position for alternatively projecting an image of an original to said viewing section or to said copying section focal plane, means for delivering copy paper to said copying section, a drive and timing sprocket chain traversing a predetermined run, selectively actuated drive means for cycling said sprocket chain, transfer means motivated by said sprocket chain for successively advancing and retracting said mirror at spaced intervals during a cycle of said sprocket chain and including a pair of longitudinally spaced first sprocket chain sections carried by and transversely offset from said endless sprocket chain, a sprocket wheel located in the path of and successively engageable and rotatable by said sprocket chain sections at spaced intervals and means for swinging said mirror between said advanced and retracted positions with the rotation of said sprocket wheel, means on said sprocket chain for motivating said copy paper delivery means, an actuating element carried by said sprocket chain and means including a first switch actuated by said actuating element at a predetermined position for exposing copy paper supported at said focal plane to an image of said original for a predetermined time in response to the actuation of said switch while said mirror is in said advanced condition.

3,856,398

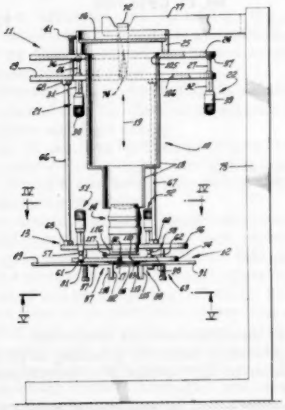
APPARATUS AND METHOD FOR WIDE AREA, DARK FIELD, HIGH RESOLUTION AUTORADIOGRAPHY

Dermot B. Taylor, 3914 Sierks Way, Malibu, Calif. 90265

Filed Nov. 13, 1972, Ser. No. 305,993

Int. Cl. G03b *27/68*

U.S. Cl. 355—63 **7 Claims**



1. A wide field high resolution microscopy camera apparatus comprising:

a camera frame having a lower object end and, vertically aligned thereabove, an upper image end;

an image stage defining an image plane and including a holder for a photographic film;

an object stage defining an object plane and including a holder for a substantially planar object to be photographed;

a lens system carried by said camera frame defining an optical axis;

means mounting the image stage to the image end of said camera frame including a set of three micrometer means located at the vertices of an imaginary equilateral triangle within the image plane with each micrometer means individually providing for adjustable displacement of the image stage relative to the image end along a line parallel to said optical axis and passing through the associated vertex;

means for mounting the object stage to the object end of said camera frame including a second set of three micrometer means located at the vertices of an imaginary equilateral triangle in the object plane with such imaginary triangle being rotated 60° relative to the first named imaginary triangle and with each micrometer means providing individual adjustable displacement of the object stage relative to the object end along a line parallel to said optical axis and passing through the associated vertex, whereby each object stage micrometer means may be adjusted cooperatively with the diametrically opposed image stage micrometer means to adjustably rotate, respectively, the object stage plane and the image stage plane about parallel and spaced apart axes.

3,856,399

AUTOMATICALLY ADJUSTABLE FOCUSING SYSTEM

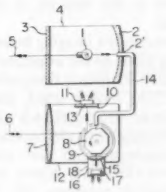
Kazuya Hosoe, and Seiichi Matsumoto, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1973, Ser. No. 341,056

Claims priority, application Japan, Mar. 22, 1972, 47-28772

Int. Cl. G01c *3/08*

U.S. Cl. 356—1 **14 Claims**



1. A focusing system having an adjustable objective, said focusing system comprising: a radiating source for radiating a radiant ray amplitude-modulated at a constant frequency on an object; a first photoelectric conversion means which receives a radiant ray reflected from said object of the ray radiated from said radiating source towards the object; a second photoelectric conversion means which receives a radiant ray directly obtainable from said radiating source; a light receiving means arranged in a constant spaced relation of base line with said radiating source, said light receiving means having [an intermittently radiating] means which receives a radiant ray reflected from said object of the ray radiated from said radiating source towards the object to intermittently project flux of radiant rays on said first photoelectric conversion means and to intermittently project flux of radiant rays directly obtainable from said radiating source on said second photoelectric conversion means; optical means arranged frontwardly of said light receiving means and adapted to direct the reflected ray from the object into said light receiving means; and a range detecting means for receiving the same radiant rays radiated from said radiating source into said first and second photoelectric conversion means and for detecting the range of object by comparing a time difference of signals obtainable at said first and second photoelectric conversion means.

3,856,400
APPARATUS FOR NO-CONTACT MEASUREMENT HAVING A MULTI-COLORED GRATING

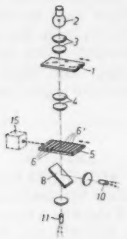
Horst Hartmann, Wetzlar, and Hans-Werner Stankewitz, Steindorf, both of Germany, assignors to Ernst Leitz GmbH, Wetzlar, Germany

Filed Feb. 22, 1973, Ser. No. 334,601

Claims priority, application Germany, Mar. 6, 1972, 2210681

Int. Cl. G01p *3/36*

U.S. Cl. 356—28 **10 Claims**



1. In an apparatus for the no-contact measurement of the velocity, the path, or the distance of an object without special optical markers with respect to a reference position having the object imaged by an objective onto a grating along an imaging beam path and measuring the light flux leaving the grating after cooperation with the grating by means of photoelectric elements generating output signals which exhibit a frequency component proportional to the velocity of movement, the improvement comprising:

a grating (**5, 25**) located in the imaging beam path in proximity to the imaging plane of the objective (**4**) defining a correlator and position frequency filter, said grating comprising a support (**26**) having areal, photoelectrically distinguishable, colored structures (**6,6', 27**), said structures disposed alternatingly in side-by-side linewise relationship in correspondence with their colors, and said support followed, via chromatic splitter means (**8**) by a plurality of photoelectric receivers (**10, 11**) generating output signals which are phase-shifted with respect to one another by given amounts based on the physical configuration of the grating.

3,856,401
APARATUS FOR NO-CONTACT MEASUREMENT USING AN OSCILLATING GRATING

Knut Heitmann, and Eckart Schneider, both of Wetzlar, Germany, assignors to Ernst Leitz GmbH, Wetzlar, Germany

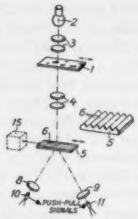
Filed Feb. 20, 1973, Ser. No. 333,514

Claims priority, application Germany, Mar. 1, 1972, 2209667

Int. Cl. G01p *3/36*

U.S. Cl. 356—28 **8 Claims**

1. In an apparatus for the no-contact measurement of the velocity or the path of objects without special optical markers with respect to a reference position in one or two coordinate directions, having imaging means with an aperture giving an image of the object onto a grating, said grating exhibiting a plurality of divisional markers geometrically dividing the object-image into at least two object-image components localized in defined aperture image planes, each image of the aperture being associated with at least one photoelectric receiver means, said receiver means generating output signals having a frequency component proportional to the motion velocity, said grating effective as a correlator and spatial frequency filter disposed in the proximity of the objective-imaging plane and associated, per coordinate, with at least two of said photoelectric receiver means, the output signals of these receiver means being in push-pull relationship to one another, the improvement comprising:



electrical drive means (**15**) providing oscillatory or continuous relative movement between said object image and said grating (**5',6,25**).

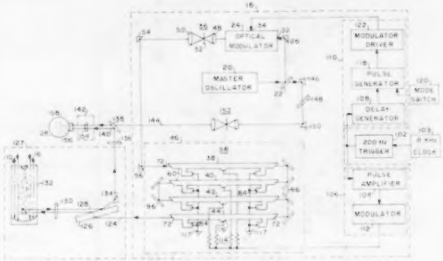
3,856,402
CLEAR AIR TURBULENCE DETECTOR

George M. Low, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Werner K. Dahm, 7605 Martha Dr. S.E., Huntsville, Ala. 35803; Donald J. Delgrego, 3 Edgar Rd., Billerica, Mass. 01821; Irving Goldstein, 77 Pond Ave., Brookline, Mass. 02146; Robert M. Huffaker, Rt. 4, Box 1842, Huntsville, Ala. 35803; Albert V. Jelalian, 3 Reeves Rd., Bedford, Mass. 01730; Wayne H. Keene, 6 Homestead Dr., Medfield, Mass. 02052; Perry A. Miles, 3 Dewey Rd., Lexington, Mass. 02173, and Charles M. Sonnenschein, 19 Nimitz Cir., Natick, Mass. 01760

Filed Apr. 11, 1973, Ser. No. 350,249

Int. Cl. G01c *3/08*

U.S. Cl. 356—5 **12 Claims**



1. A clear air turbulence detector comprising:

laser light generating means for providing as an output a narrow beam of light energy of a predetermined frequency;

pulse generating means for providing a train of electrical pulses at a preselected rate and of a preselected width;

modulation means responsive to said laser light generating means and said pulse generating means for providing pulses of said beam of light energy corresponding in time to the pulse output of said pulse generating means;

optical transmission means responsive to the output of said modulation means for transmitting pulses of narrow beam light in a selected direction and for receiving reflected returns of said pulses of said light;

detection means responsive to an output of said optical transmission means of reflected returns of light for providing as an output, discrete electrical signals of a frequency proportional to the velocity of aerosols from which the light returns are reflected;

filter means responsive to the output of said detection means for providing a plurality of outputs, each output

being selectively responsive to signal frequencies within a selected discrete band of frequencies within a selected overall range of frequencies of the detector;

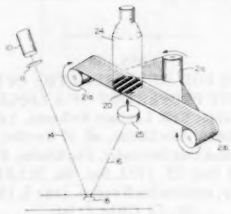
gating means coupled to said filter means for passing a selected sequence of outputs of said filter means as a set of outputs for each of a plurality of selected ranges from the clear air turbulence detector of aerosols providing reflected returns of light; and

indicating means responsive to said filter means for indicating the velocities of aerosols providing returns and the distance of said aerosols from said detector.

3,856,403
VELOCITY BIASED LASER VELOCIMETER

Robert W. Maughmer, Thousand Oaks, and John R. Yamamoto, Sherman Oaks, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Continuation of Ser. No. 116,918, Feb. 19, 1971, abandoned. This application Mar. 9, 1973, Ser. No. 339,685
Int. Cl. G01p *3/36*
U.S. Cl. 356—28 **10 Claims**



1. An apparatus for measuring the relative three-dimensional vectorial velocity in a coordinate system between a moving object mounted thereto and an adjacent surface, said apparatus comprising:

illuminating means developing a plurality of coherent beams of light for illuminating separate portions of said surface with light energy;

means for receiving light energy reflected from said surface at three different angles of reflection, said last-mentioned receiving means having three functionally separate signal processing channels;

three optical gratings disposed between said surface and said receiving means with each functionally separate grating modulating the reflected light energy processed by a corresponding one of said separate channels, a first one of said optical gratings effectively located at a different point in the coordinate system from said second and third ones of said optical gratings, said second and third gratings having a different orientation with respect to one another in the coordinate system, each said optical grating having alternate transparent and opaque lines extending in a direction normal to a corresponding velocity component V_a, V_b, and V_c to be measured in predetermined directions *a*, *b*, and *c*, said opaque lines interrupting the reflected light energy points so that said receiving means detects the resulting motion of each of the interrupted energy points and converts the energy points into pulses for a signal representative of the relative velocity components V_a, V_b, and V_c between the moving object and the adjacent surface, each said optical grating adapted for continuous motion parallel to the direction of the velocity component at an effective velocity V_g relative to said receiving means;

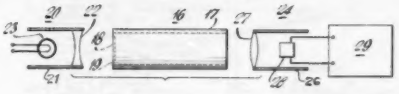
V_g being selectively adjusted when said object has zero relative velocity with respect to said surface so that $V_g \geq 0$, $V_b \geq 0$, and $V_c \geq 0$; and

means coupled to said receiving means for deriving signals representative of the three-dimensional vectorial velocity between said moving object and said surface in a predetermined coordinate system.

3,856,404
METHOD AND APPARATUS FOR MEASURING VAPOR PRESSURE

Abe Hershler, New York, N.Y., assignor to Phys-Chemical Research Corp., New York, N.Y.

Filed June 6, 1973, Ser. No. 367,612
Int. Cl. G01n *21/22*
U.S. Cl. 356—36 **23 Claims**

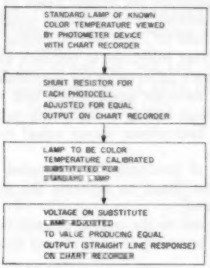


12. A vapor pressure sensor comprising a transparent body member having microcapillary pores formed in a surface thereof, said pores having diameters between 100 and 400 Angstram units and depths at least equal to said diameters.

3,856,405
METHOD FOR COLOR TEMPERATURE CALIBRATION OF TUNGSTEN

Martin Lazarus, Dover, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 25, 1974, Ser. No. 436,581
Int. Cl. G01j *3/34, 3/50, 5/52*
U.S. Cl. 356—46 **6 Claims**


STANDARD LAMP OF KNOWN COLOR TEMPERATURE VIEWED BY PHOTOMETER DEVICE WITH CHART RECORDER
SHUNT RESISTOR FOR EACH PHOTOCELL ADJUSTED FOR EQUAL OUTPUT ON CHART RECORDER
LAMP TO BE COLOR TEMPERATURE CALIBRATED SUBSTITUTED FOR STANDARD LAMP
VOLTAGE ON SUBSTITUTE LAMP ADJUSTED TO VALUE PRODUCING EQUAL OUTPUT (STRAIGHT LINE RESPONSE) ON CHART RECORDER

1. A method for color temperature calibrating an unknown filamentary lamp, comprising the steps of:

A. energizing a standard filamentary lamp at a predetermined voltage to cause said lamp to emit radiation of known color temperature;

B. directing said radiation emitted by said standard lamp successively onto a series of radiation-sensitive sensors, with the sensors connected in series with an output comparing means, and each sensor shunted by a variable resistor, each sensor being adapted to respond to a different pass band of the radiation spectrum of said lamp to produce a corresponding indication on said means;

C. adjusting each of said resistors while the associated sensor is exposed to said standard lamp to produce equal outputs from said means; and then

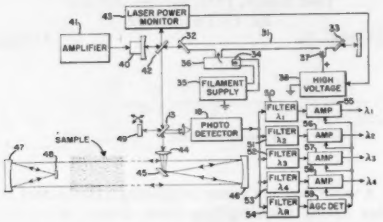
D. replacing said standard lamp with said unknown lamp, energizing said unknown lamp from a variable voltage source, directing the radiation emitted from said unknown lamp successively onto said series of sensors, and adjusting the voltage of said source to a value which produces equal outputs from said means.

3,856,406

HETERODYNE LASER ABSORPTION SPECTROMETER

Milton L. Noble, Pennellville, and Lawrence R. Snowman, Liverpool, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Nov. 23, 1973, Ser. No. 418,389
Int. Cl. G01b 9/02; G01n 21/34; G01j 3/42
U.S. Cl. 356—106 S 3 Claims



1. A laser absorption spectrometer comprising:

a. a laser for producing an output beam having:

1. a gaseous medium capable of simultaneous optical amplification at a plurality of optical frequencies, each line being subject to Doppler broadening,
2. an optically resonant cavity, optically coupled to said gaseous medium and supporting multimode operation within said broadened line, and
3. means for frequency modulating the optical output of said laser in a linear sawtooth manner to displace the frequency of each laser line by an amount inversely proportional to its wavelength by changing the resonant frequency of said optical cavity to produce mode pulling,

b. means to separate the output beam of said laser into a first and a second beam pursuing separate paths and to recombine said first and second beams with a fixed mutual time delay sufficient to produce electrically resolvable frequency differences for individual lines,

c. an optical detector upon which said mutually delayed beams impinge having a bandwidth sufficiently great to reproduce heterodyne waves equal to said frequency differences,

d. a plurality of bandpass filters coupled to the output of said detector tuned to separate the heterodyne waves produced, and

e. means coupled to the output of each bandpass filter for sensing the intensity of each of said heterodynes.

3,856,407

AUTOMATIC FOCUSING DEVICE

Hideomi Takeda, and Harumi Kawasaki, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

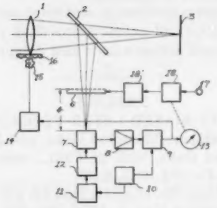
Filed Nov. 2, 1973, Ser. No. 412,457
Claims priority, application Japan, Nov. 14, 1972, 47-113992
Int. Cl. G01j 1/00; G03b 3/00
U.S. Cl. 356—123 6 Claims

1. Automatic focusing apparatus comprising:

first means, including a lens, defining an optical path such that at least a portion of light passing through the lens impinges upon a plane, the lens and the plane being movable relative to each other in either of two opposite directions along the optical path,

second means, including a photoelectic element responsive to the light impinging upon the plane, for producing an electrical focusing control signal that varies in accordance with the degree of contrast in the light impinging upon the plane, the degree of contrast being maximum for an in-focus spacing between the lens and the plane,

an optical transmission function filter for increasing the difference between the degree of contrast obtained at an in-focus spacing and the degree of contrast obtained at an out-of-focus spacing, the filter comprising a two-dimensional diffraction grating disposed in the optical path and spaced from both the lens and the plane, and



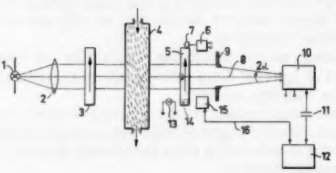
third means responsive to the electrical focusing control signal for adjusting the spacing between the lens and the plane to a relative position that maximizes the degree of contrast.

3,856,408

APPARATUS FOR MEASURING THE OPTICALLY BIREFRINGENT PROPERTIES OF A LIQUID SAMPLE

Jan Erik Hill, Solna; Erik Lennart Eriksson, Vallentuna, and Mats Lennartsson, Stockholm, all of Sweden, assignors to Svenska Traforskningsinstitutet, Stockholm, Sweden

Filed May 25, 1973, Ser. No. 363,816
Claims priority, application Sweden, June 5, 1972, 7353/72
Int. Cl. G01n 21/40
U.S. Cl. 356—114 3 Claims



1. An apparatus for measuring the optically birefringent properties of a liquid sample, comprising a source of parallel light, a first fixed polarized for plane polarizing the light, a sample holder disposed to be transilluminated by said plane polarized light, analyzing means comprising a second polarizer rotating at a constant speed and disposed to receive said plane polarized light, a first photoelectric detector for receiving the light transmitted by said rotatable polarizer, means for generating a periodic electric reference signal with a steep edge in synchronism with the rotation of the rotatable polarizer, phase comparing means receiving said reference signal and an output signal from the photoelectric detector, and means for forming the phase difference between said signals supplied to the comparing means along a common time axis.

3,856,409

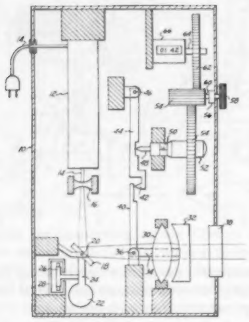
LASER ALIGNMENT DEVICE

Ivan Cindrich, Southfield; Carl C. Aleksoff, and Alex Klooster, Jr., both of Ann Arbor, all of Mich., assignors to KCA Laser Systems, Ann Arbor, Mich.

Filed May 9, 1973, Ser. No. 358,765
Int. Cl. G01b 11/26
U.S. Cl. 356—138 16 Claims

1. A device for adjusting the angle of inclination of a light beam, comprising: a housing; a plano-concave lens pivotably

supported with respect to the housing for motion about a first pivot point located at the center of curvature of its concave section; a first lever arm fixed with respect to said lens, a second lever arm pivotably supported with respect to the housing for motion about a second axis and having its free end in contact with the free end of said first arm; means for adjusting the position of said second arm so as to cause adjustment



of the position of said lens about said center of curvature; an optical element supported with respect to said housing adapted to receive the beam and pass it to the plano-concave lens; and means for maintaining said optical element at a constant inclination relative to the horizontal plane for a limited movement of the housing relative to the horizontal plane.

3,856,410

METHOD AND APPARATUS FOR TESTING BLADED ROTORS

Gilbert Swift, Bryan; William M. Moore, College Station, and Lionel J. Milberger, Bryan, all of Tex., assignors to Martin Tracker Corporation, College Station, Tex.

Filed Nov. 27, 1972, Ser. No. 309,892
Int. Cl. G01b *11/02*
U.S. Cl. 356—167 **17 Claims**

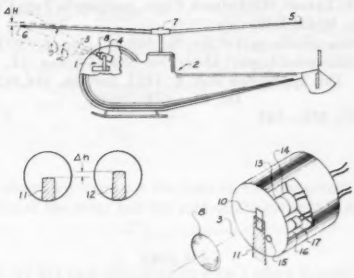
1. A method for measuring the distances by which the unmodified tips of a several bladed rotor are out-of-track, comprising:

forming an optical image of the area through which each successive blade tip travels as it passes a selected azimuth; deriving therefrom in synchronism with the rotor a succession of first electrical signals, the maximum amplitude of said first electrical signals being proportional to the brightness of the sky, said succession containing said first electrical signals, the comparative amplitudes of which are representative of the comparative axial position of each successive blade tip;

comparing selected portions of said first electrical signals to produce therefrom a succession of second electrical signals the amplitudes of which are proportional to the axial position of each successive blade tip, said amplitudes of said second electrical signals being independent of the brightness of the sky;

generating an identification signal in synchronism with the rotor whereby the portion of said second electrical signal produced by the passage of a particular blade can be identified, and

obtaining from each second electrical signals and the identification signal a comparative indication of the out-of-



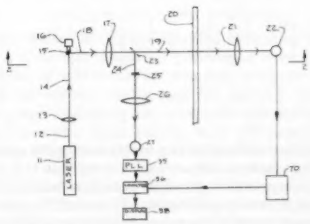
track distance of each other blade with respect to said particular blade.

3,856,411

OPTICAL NONCONTACTING DIAMETER GAUGE

Carl A. Zanoni, Middletown, Conn., assignor to Zygo Corporation, Middlefield, Conn.

Continuation-in-part of Ser. No. 368,441, June 8, 1973, abandoned. This application Aug. 14, 1973, Ser. No. 388,267
Int. Cl. G01b *11/00*
U.S. Cl. 356—167 **5 Claims**



1. An electrooptical device for measuring the cross-sectional width of an opaque test object which comprises (1) a source of radiant energy which provides a narrow beam; (2) means for scanning this beam in a direction perpendicular to its direction of propagation; (3) means for collecting and splitting said scanned beam into first and second portions and (4A) to direct said first portion of said beam onto a first photodetector through a precision scale with alternate transparent and opaque bands at least about half the width of the diameter of said scanned beam, to produce a sinusoidal signal whose spatial frequency corresponds to the spacings on said precision scale, and thence onto (5) means for breaking up said signal to produce a much higher frequency locked in phase to the output of said first photodetector, and (4B) to direct said second portion of said beam past said opaque test object onto a second photodetector which detects the modula-

tion of said scanned beam by said test object; and (6) means connected to the signals derived from both portions of said beam for measuring the number of pulses while the energy is interrupted by the test object to produce a signal corresponding to the cross-sectional width of said test object.

3,856,412

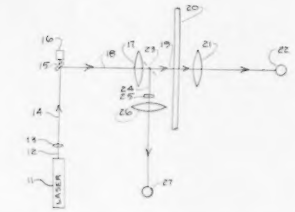
OPTICAL NONCONTACTING GAUGE

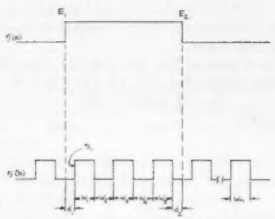
Carl A. Zanoni, Middletown, Conn., assignor to Zygo Corporation, Middlefield, Conn.

Continuation-in-part of Ser. No. 368,441, June 8, 1973, , and a continuation-in-part of Ser. No. 388,267, Aug. 14, 1973,. This application Sept. 6, 1973, Ser. No. 394,562

Int. Cl. G01b *11/00*

U.S. Cl. 356—167 **7 Claims**





1. An electrooptical device for measuring the crosssectional width of an opaque object which comprises (1) a source of radiant energy which provides a narrow beam; (2) rotating means for scanning said beam; (3) means for collecting and splitting said scanned beam into first and second portions, and for passing (4A) said first portion of said beam through a precision scale, with alternate transparent and opaque bands of equal width, at least half the width of the diameter of said scanned beam, onto a first photodetector to produce a sinusoidal signal with spatial frequency corresponding to the spacings on the precision scale; (4B) said second portion of said beam past an opaque object onto a second photodetector for photoelectrically detecting the modulation of the scanned light beam by said test object; (5) means for squaring off said sinusoidal signal derived from said first portion of said scanned beam; (6) means for generating a fine vernier; and (7) means connected to the signals from said squaring off means, said vernier, and said second photodetector for measuring the number of full pulses and vernier pulses during the interruption of said second portion of said beam by said test object, to produce a signal corresponding to the cross-sectional width of said test object.

3,856,413

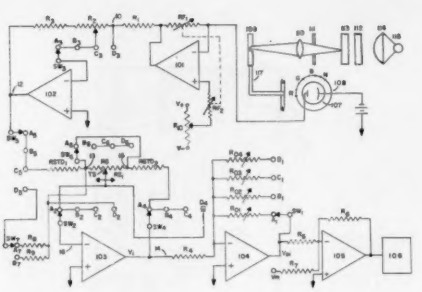
PHOTOGRAPHIC COLOR DENSITOMETER

Paul P. Bey, and Michael P. Bey, both of 4909 Abbott Dr., Temple Hills, Md. 20031

Filed Jan. 18, 1973, Ser. No. 324,664

Int. Cl. G01j *3/50*

U.S. Cl. 356—175 **21 Claims**



1. A photometric device for determining the difference in optical density between a standard optical absorber and an unknown optical absorber comprising:

a light source for generating light of a particular intensity incident on an optical absorber;

optical coupling means for directing said generated light through said optical absorber;

selectable primary color filter means disposed in the optical path of light transmitted through said optical absorber;

detector means for collecting light transmitted through said optical absorber and said selectable primary color filter means, said detector means providing a detector current proportional to the intensity of the selected spectral component of said transmitted light;

voltage generating means coupled to said detector means for producing a voltage proportional to said detector current;

a first operational amplifier means and associated variable feedback resistive means coupled to said voltage generating means, producing a voltage proportional to said detector current and wherein the gain of said first operational amplifier is adjustable by said variable feedback resistive means;

a second operational amplifier means and associated feedback potentiometer means coupled to said first operational amplifier means for providing an adjustable resistive ratio and corresponding amplifier gain in inverse proportion to the intensity of each of the said individual spectral components of said transmitted light incident on said detector means corresponding to selectable color reference voltages generated by said second operational amplifier means for each of said individual spectral components of said incident light on said detector means;

density calibration means coupled to said potentiometer means for displaying said difference in optical density;

memory standard means coupled to said second operational amplifier means comprising a third operational amplifier means with selectable variable feedback resistive means and associated gain establishing said selectable color reference voltages wherein each selectable voltage corresponds to the intensity of light transmitted through said standard optical absorber and one of said selected primary color filters;

voltage comparing means coupled to said third operational amplifier means and to a fixed voltage means;

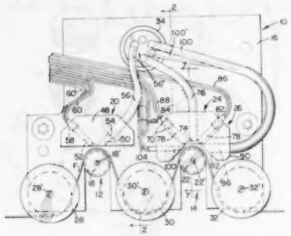
null detecting means coupled to said voltage comparing means providing an indication when said fixed voltage is equal to the voltage generated by said third operational amplifier.

3,856,414

APPARATUS FOR INSPECTING STRIP MATERIAL

Robert F. Menary, Northbrook, Ill., assignor to Paulmar, Incorporated, Northbrook, Ill.

Filed Jan. 18, 1973, Ser. No. 324,674
Int. Cl. G01n 21/32
U.S. Cl. 356—200 19 Claims



19. A machine for inspecting movie film or similar strip material and for detecting defects of a predetermined character in the material including variations in thickness exceeding a predetermined length due to improper splicing or the presence of adhesive tape or the like and damage in the form of edge tears, holes and the like, which machine comprises means for supporting the strip material for advance along a predetermined path, a plurality of inspection stations spaced along said path, means for advancing said strip material through said inspection stations, a single light source, a plurality of fiber optic light conduits each of which conduits has one end disposed so as to receive light from said single light source and the opposite end disposed adjacent an inspection station so as to direct a light beam in predetermined angular relation onto the exposed surface of said traveling strip material, light sensor means positioned relative to the beam emitting end of each said conduit and said exposed material surface so as to produce an output signal when there is a change in the light received from the associated conduit which change results from the presence of one of said defects in the traveling material, and means actuated by said output signal for interrupting the strip material advancing means when one of said defects is detected by said sensing means.

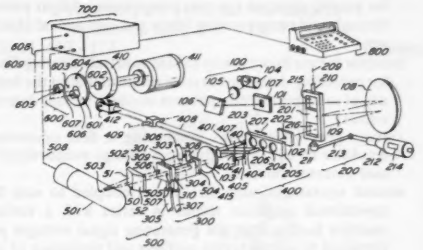
3,856,415

LIGHT SHIFTING SYSTEM FOR USE IN AN OPTICAL INSTRUMENT, SUCH AS A SPECTROPHOTOMETER

Manuel C. Sanz, and Georges Revillet, both of Geneva, Switzerland, assignors to Micromedic Systems, Inc., Philadelphia, Pa.

Filed Mar. 28, 1973, Ser. No. 345,804
Claims priority, application Switzerland, Apr. 28, 1972, 6419/72
Int. Cl. G01j 3/08; G02f 1/34
U.S. Cl. 356—205 10 Claims

1. A device, adapted to be used in optical instruments for shifting a light beam from an incident path alternately to each of two offset parallel emergent paths which are parallel to the incident path, comprising two transparent members, each having parallel front and back surfaces, the distance from the front to the back surface being the same in each member, one of the members being mounted in cross-wise relationship adjacent the other with the front faces of the two members lying in the separate planes of a dihedral angle, the vertex of which is a straight line which lies in the plane bisecting the angle, a reciprocable support, the transparent members being mounted on the support so that the optical axis of the incident light beam lies in the plane bisecting the dihedral angle with the vertex in the path of the incident light beam and perpendicular to the optical axis of the incident beam, and means for reciprocating the support, with the transparent members mounted thereon, in a direction generally parallel to the vertex to alternately interpose the front face of one member and then that of the other into the path of the incident beam.

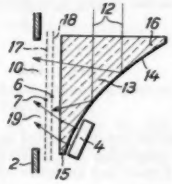


3,856,416

LIGHT METER WITH NUCLEAR LIGHT SOURCE

Ewald Schmidt, Braunfels, and Willi Wiessner, Wetzlar, both of Germany, assignors to Ernst Leitz G.m.b.H., Wetzlar, Germany

Filed Sept. 12, 1972, Ser. No. 288,375
Claims priority, application Germany, Sept. 27, 1971, 2148106
Int. Cl. G01j 1/42
U.S. Cl. 356—219 14 Claims



1. A light meter having coordinated indicating elements including a scale and means for pointing, a front plate disposed in front of said means for pointing, an aperture in the front plate for viewing said means for pointing, means for illuminating said indicating elements with external light and with a self-powered light source, said self-powered light source being disposed behind said means for pointing, said scale having a first section for measuring weak light and a second section for measuring higher light intensity, means for illuminating said first section with self-powered light source, and means for illuminating said second section with said external light.

3,856,417

PHOTOGRAPHIC COLOR DENSITOMETER

Paul P. Bey, and Michael P. Bey, both of 4909 Abbot Dr., Temple Hills, Md. 20031

Filed Nov. 30, 1971, Ser. No. 203,282
Int. Cl. G01j 1/10
U.S. Cl. 356—229 10 Claims

1. A photometric device for determining a difference in optical density between a standard optical absorber and an unknown optical absorber comprising:

a light source for generating light of a particular intensity;

optical compensating filters placed in the optical path of said light source to modify the spectral distribution of said light source;

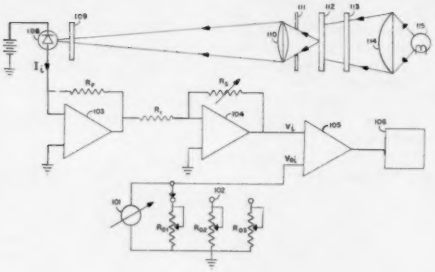
optical absorbers comprising alternately a standard reference and unknown absorber placed in the optical path of said light source;

Means for supporting a plurality of spectral selecting filters for passing selected spectral components of light passing through said compensating filters and said optical absorbers;

detector means in proximity to said spectral selecting filters for providing detector currents proportional to the intensity of said spectral components incident on said detector means;

voltage generating means comprising a first operational amplifier means for producing a voltage proportional to said detector currents;

second operational amplifier means coupled to said first operational amplifier means in series with a variable resistive feedback means generating signal voltages proportional to said detector currents and resistance of said variable resistive feedback means;



density calibration means coupled to said variable resistive means for displaying the difference in optical density between a known and unknown optical absorber;

memory standard means for generating selectable standard reference voltages wherein each selectable voltage corresponds to an individual spectral component of light having passed through said standard optical absorber;

voltage comparing means comprising a difference amplifier coupled to said second operational amplifier means and to said memory standard means producing a null voltage when said memory reference voltage is equal to said representative signal voltage corresponding to a particular resistance of said resistive feedback means;

indicating means coupled to said voltage comparing means for providing an indication when said representative signal voltage and said reference memory voltage are equal.

3,856,418

LIGHT METERING AND CONTROLLING DEVICE

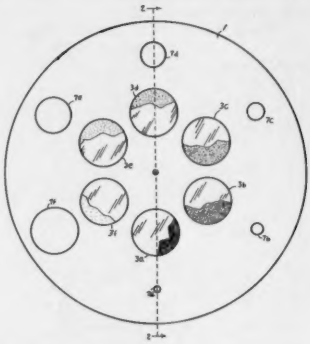
Ira A. Levine, 6716 Eastern Ave. N.W., Washington, D.C. 20012

Filed June 25, 1973, Ser. No. 373,255

Int. Cl. G01j *1/40*

U.S. Cl. 356—233 **5 Claims**

1. A light metering and controlling device comprising a support, a series of light filter means mounted in said support, said filter means progressively and decreasingly varying in light transmission therethrough, a series of light apertures in said support, each light aperture being correlated with a respective filter means, the area of each light aperture progressively varying in proportion with the light transmitted through its correlated filter means, the light aperture with the smallest



area being correlated with the filter means transmitting the least light.

3,856,419

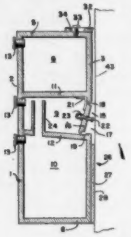
NON-OVERLAPPING COATING DEVICE

Ira A. Levine, 6716 Eastern Ave. N.W., Washington, D.C. 20012

Filed Sept. 11, 1972, Ser. No. 287,641

Int. Cl. B05c *5/02*

U.S. Cl. 401—5 **8 Claims**



1. A liquid coating device comprising a body having a front wall and additional wall means forming a feeder reservoir, an opening means in the front wall communicating with the reservoir, a closure for the opening means normally closing the same, operating means to variably open said closure to permit flow of coating material onto the work surface to be coated, a doctor blade located on one side of said opening means and extending lengthwise across the width of the body, and a planar guiding and support means on and projecting from said body on a direction normal to said front wall and located entirely on the other side of said opening means, the dimension of said guide support means measured along the width of said body being less than the length of the doctor blade extending across the body.

3,856,420

EXTENDED-LIFE PEN

Fay W. Oltmann, Anamosa, Iowa, assignor to Souvenir/Incorporated, Cedar Rapids, Iowa

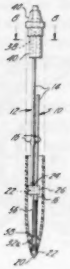
Filed Jan. 23, 1974, Ser. No. 435,881

Int. Cl. B43k *7/12, 27/04*

U.S. Cl. 401—109 **5 Claims**

1. An extended-life pen, including first and second elongated pen units disposed side by side with a segment of each of said pen units projecting beyond an end of the other of said

pen units, each of said pen units having a writing tip, barrel means containing said pen units and having guiding passage means at one end thereof for exposing the writing tip of said first pen unit and having means at the opposite end thereof for applying writing thrust to the projecting end portion of said second pen unit, and means linking said pen units together for

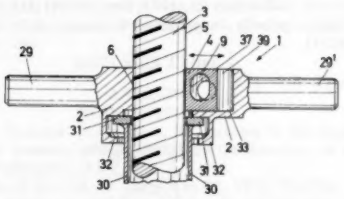


transmitting said writing thrust from said second pen unit to said first pen unit, said first and second pen units being interchangeable for disposing the writing tip of the second pen unit in said guiding passage and for utilizing the first pen unit to transmit writing thrust from said barrel means to said second pen unit.

3,856,421
SUPPORT POLE

Walter Nogler, Innsbruck, Austria, assignor to Gebruder Kollensperger, Innsbruck, Austria

Filed May 2, 1973, Ser. No. 356,447
Claims priority, application Austria, May 2, 1972, 3783/72
Int. Cl. E04g *25/06*
U.S. Cl. 403—118 **8 Claims**



1. A supporting device, preferably for scaffolds, formworks and such used in construction, said device comprising:

an external tube;

a screw spindle adjustably movable within said tube;

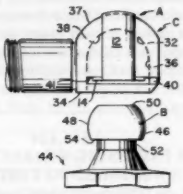
a built-up split nut that fixes the position of said screw spindle telescopically movably within said external tube, said split nut being revolvably positioned at an end of said external tube through which the screw spindle is moved, said split nut comprising first and second parts movable with respect to each other in a linear and radial direction to an open and a locked position, said first part comprising a housing positioned on said end of said tube, and said second part comprising a sliding body movable in said housing in a radial direction toward and away from said screw spindle, said sliding body having a hole extending at least partially therethrough; and

an eccentric positioned in said hole to be rotatable in said housing around an axis normal to the sliding direction of said sliding body.

3,856,422
RETENTION CLIP FOR BALL AND SOCKET JOINT

William A. Trefry, 29540 Cunningham Dr., Warren, Mich. 48092

Filed May 29, 1973, Ser. No. 364,618
Int. Cl. B25j *3/38;* **F16b** *7/00*
U.S. Cl. 403—122 **12 Claims**

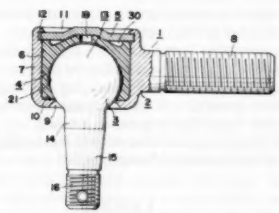


1. A retention clip for holding a ball and socket joint in assembly, said retention clip comprising an elongated resilient metal strip of substantial width relative to its thickness, said strip having a longitudinally curved central portion, said strip terminating ir end portions extending from the ends of said central portion laterally inwardly toward one another, the inner edges of said end portions being disposed in spaced relation to one another, said end portions in the unstressed condition of said strip being inclined with respect to a plane through their outer edges in a direction toward said central portion from their outer edges to their inner edges, said end portions being resistant to forces tending to flex them away from said central portion, said central portion being flexible and capable of opening out in response to the application of spreading forces on the inner edges of said end portions.

3,856,423
BALL JOINT

Yasuo Uchida, Hamamatsu, Japan, assignor to Ishikawa Tekko Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 10, 1973, Ser. No. 349,692
Claims priority, application Japan, Feb. 6, 1973, 48-15275
Int. Cl. B25g *3/38;* **F16f** *7/00;* **F16c** *11/06*
U.S. Cl. 403—140 **4 Claims**



1. A ball joint comprising a socket having a cylindrical inner surface and openings provided at both ends thereof, a ball stud having a spherical head, a bearing member for the spherical head which is mounted in said socket and which includes upper and lower concave bearing surfaces which are respectively disposed above and below the equatorial plane of the spherical head and which are connected in a region of their mutual largest diameter, said spherical head being supported by a pair of upper and lower bearing regions and an annular volume for receiving a lubricant supply existing between the region of the equatorial plane of said spherical head and the bearing surfaces, and further comprising a cover associated with said bearing member and inserted into said socket, characterized in that: said upper and lower bearing regions are respectively disposed substantially in the middle of said bear-

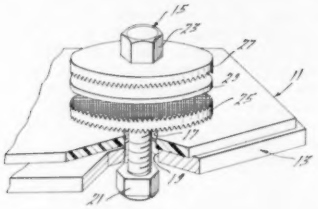
ing surfaces, an air gap exists between the spherical head and the apex of the upper bearing surface, the bearing member includes in its upper side an annular recess disposed to generally correspond to the upper bearing region and a domed area at the top of said bearing member radially within said recess, the lower exterior surface of said bearing member being substantially cylindrical, and the upper exterior surface of said bearing member being biased outwardly from the cylindrical shape of said lower surface so that the uppermost portion of the upper exterior surface has a tendency to have a greater radius than the radius of said lower surface, and said cover abutting the upper side of the bearing member thereby axially pre-loading the ball stud, and defining an annular cavity between said upper side of the bearing member and said cover.

3,856,424

MEANS FOR FASTENING A STRUCTURAL MEMBER SUBJECT TO CREEP

Robert H. Beck, Jr., Dearborn, and Kenneth C. Rusch, Detroit, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 3, 1971, Ser. No. 204,534
Int. Cl. F16b *5/00*
U.S. Cl. 403—227 **15 Claims**



8. Fastening means for joining a plastic structural member subject to creep to a bolt-type fastener comprising

first, second and third rigid members,

said plastic member being sandwiched between said first and second rigid members,

a resilient member being sandwiched between said second and third rigid members,

said resilient member having greater resiliency, less rigidity and less creep than said plastic member,

aligned openings formed in said rigid plastic and resilient members receiving said bolt-type fastener,

said fastener when installed loading said rigid plastic and resilient members in compression whereby the resilient member loads the fastener in tension,

at least one of the surfaces of said rigid members engaging said plastic material being knurled.

3,856,425

ADJUSTABLE SIDE FOR SLIP FORM

Charles P. Miller; Allen R. Miller, both of McHenry, and David J. Miller, Ringwood, all of Ill., assignors to Miller Formless Co., Inc., McHenry, Ill.

Continuation-in-part of Ser. No. 103,423, Jan. 4, 1971, which is a continuation-in-part of Ser. No. 774,014, Nov. 7, 1968, Pat. No. 3,606,827. This application Nov. 20, 1972, Ser. No. 308,174
Int. Cl. E01c *19/00*
U.S. Cl. 404—84 **14 Claims**

1. A slip form for transport by a machine over a grade to lay a continuous layer of formable material therealong comprising:

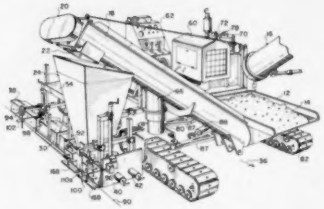
an elongated form member adapted to be supported from said machine with its longitudinal axis extending along the path of travel;

said form member having laterally spaced sidewalls depending from an enclosing top wall;

said sidewalls having bottom edge portions defining the lateral limits of said continuous layer;

a skirt member associated with and contiguous to the outside bottom edge portion of one of said sidewalls;

vertically adjustable support means extending from said machine and carrying said skirt member for vertical movement independent of said one side wall of said form member;



power means provided by said machine for actuating said support means; and

sensor means carried by said machine and operatively controlling said power means to raise and lower said skirt member;

said sensor means being slideably engageable with said grade along and contiguous to said skirt member;

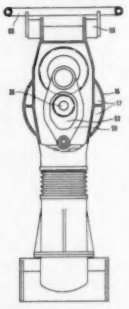
said sensor means being responsive to the depressions in said grade and operative to provide a control signal to actuate said power means and move said skirt member along the contours of said depressions.

3,856,426

RAMMING OR TAMPING MACHINE OR THE LIKE

Hans-Georg Waschulewski, Mettmann, and Hans Baumers, Dusseldorf-Gerresheim, both of Germany, assignors to Losenhausen Maschinenbau AG, Dusseldorf-Grafenberg, Germany

Filed July 23, 1973, Ser. No. 381,325
Claims priority, application Germany, July 25, 1972, 2236371
Int. Cl. E01c *19/34*
U.S. Cl. 404—133 **6 Claims**



1. In a hand manipulated tamping apparatus comprising an upper casing, a tamping tool device below said casing, a crank device in the casing, a spring oscillating set connecting the drive and the device, a flange-mounted diesel engine secured

to the casing and having a drive shaft, and a gear drive connecting the engine drive shaft and the crank drive, the improvement comprising:

said drives including an intermediate shaft coaxial with the engine drive shaft, a pinion mounted on the intermediate shaft, a crankshaft mounted above the intermediate shaft and parallel thereto, a gear mounted on the crankshaft and engaging said pinion, and a connecting rod having an upper and lower end and an opening therebetween, the upper end being connected to the crankshaft, the lower end being connected to said oscillating set, said intermediate shaft extending through said opening with the connecting rod thereby encircling said intermediate shaft.

3,856,427

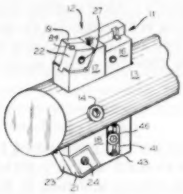
ADJUSTABLE BORING TOOL

Norman H. Lovendahl, 2728 N. Clinton St., River Grove, Ill. 60171

Filed Nov. 1, 1972, Ser. No. 302,890

Int. Cl. B23b *29/034*

U.S. Cl. 408—182 **15 Claims**



1. An adjustable boring tool comprising a boring block,

said boring block having oppositely disposed, spaced-apart cutting tools thereon,

motion determining means for simultaneously advancing both of said cutting tools out from or toward the center of the boring block to adjust the diameter of the bore, and unitary means engaging said motion determining means for equalizing the distance between the center of said block and the cutting edge of each of said cutting tools by moving said motion determining means in either direction along its longtiduinal axis relative to the center of the boring tool.

3,856,428

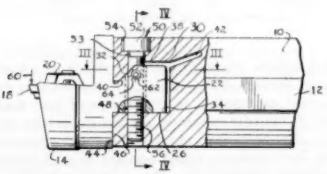
TOOL SUPPORT

William C. Eversole, Mount Zion, Ill., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 257,051, May 25, 1972, Pat. No. 3,801,213, which is a continuation of Ser. No. 89,186, Nov. 13, 1970, abandoned. This application Nov. 27, 1973, Ser. No. 419,337

Int. Cl. B23b *29/02*

U.S. Cl. 408—240 **5 Claims**



1. In a head to support a cutting insert and adapted for adjustable mounting on a grooved support; a body of machinable metal and having a longitudinal axis, said body having an intermediate portion and an axially extending end portion on each side thereof, pocket means for receiving a cutting insert formed in one end portion of said body, a diametral tongue formed on said other end portion of said body and adapted for insertion into the groove of a grooved support, the side of said intermediate portion of said body from which said tongue protrudes being disposed in a flat plane perpendicular to the axis of said body, one side of said tongue being parallel to the axis of said body, the other side of said tongue comprising an inclined portion adjacent said body which diverges from the axis of said body in a direction away from said body, and a slot through said tongue on an axis perpendicular to said one side of the tongue and elongated in a direction perpendicular to the axis of said body, said slot adapted for receiving a clamp bolt for clamping the head to the grooved support.

3,856,429

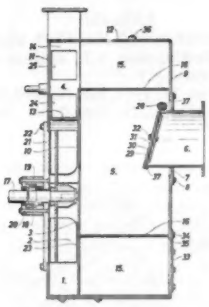
PUMP UNIT FOR THE TRANSPORTATION OF LIQUIDS

Carl Bruno Pettersson, Smedjegatan 80, Vara, Sweden

Filed Mar. 26, 1973, Ser. No. 344,997

Int. Cl. F04l *5/00*

U.S. Cl. 415—53 **3 Claims**



1. Centrifugal pump unit for pumping of liquids, comprising a pump housing, an impeller located in said housing, an outlet conduit in communication with said pump housing, said outlet conduit extending in an upwardly direction and having a side wall with a first opening at a comparatively high location relative to the pump housing, a chamber for receiving liquid in communication with said first opening, said chamber being in communication with said pump housing via additional openings in a wall of said pump housing, a second opening in said side wall of said outlet conduit at a higher level than said first opening, said second opening establishing communication between said outlet conduit and the upper portion of said chamber, and a valve plate pivotally mounted in said outlet conduit between said first and second openings, said valve plate normally extending transverse to said outlet conduit to close same when the pressure in said outlet conduit is comparatively low, and pivotable to a position substantially parallel to said side wall to open said outlet conduit when said pressure approaches the working pressure of the pump.

3,856,430

DIFFUSER WITH BOUNDARY LAYER REMOVAL

Stephen Langham, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

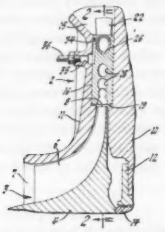
Filed July 27, 1973, Ser. No. 383,329

Int. Cl. F04d *29/44*

U.S. Cl. 415—207 **4 Claims**

1. A diffuser for a centrifugal compressor comprising, in combination, a generally annular diffuser body defining diverging diffusing passages extending generally radially and tangentially from the radially inner surface of the body to the

radially exterior surface of the body, the radially outer end of each passage being enlarged to provide a socket; a diffuser outlet tube mounted in each socket; the diffuser body defining a boundary layer exit slot between the radially inner end of



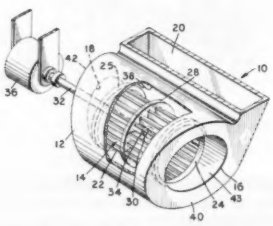
each outlet tube and the bottom of the corresponding socket; means defining a manifold extending circumferentially of the diffuser; and means within the body defining passages connecting the exit slots to the manifold.

3,856,431

SIDE EXPANSION SCROLL-TYPE BLOWERS

Carl L. Tucker, Baskingridge, N.J., assignor to The Singer Company, New York, N.Y.

Filed Oct. 24, 1973, Ser. No. 409,108
Int. Cl. F01d *25/24*; **F04d** *24/40*, *29/44*
U.S. Cl. 415—219 **4 Claims**



1. A blower unit comprising a fan wheel from which air is discharged peripherally, and a housing for said wheel including sloping side surfaces between which the wheel is wholly located, the side surfaces including openings through which air enters the housing, said housing also including ducting between the openings in the side wall and fan wheel through which the inlet air may flow to the wheel in directions generally parallel to the axis of said wheel and including a surface between the side surfaces extending in the form of a spiral about the wheel to an opening from which air moved by the wheel may be expelled, said side surfaces extending in directions diverging toward the exit opening.

3,856,432

SELF-GOVERNING TURBINE SPEED LIMITER

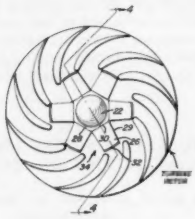
Carl J. Campagnuolo, Potomac, and Paul A. Curto, Bethesda, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 27, 1973, Ser. No. 401,314
Int. Cl. F01d *7/02*
U.S. Cl. 416—45 **8 Claims**

1. In a turbine rotor having a support plate mounting turbine blades around the periphery, a speed limiting device comprising:

a hub centrally mounted on the support plate;

movable means movably connected to the hub, the movable means having a first position whereat they overlay the hub to remain in non-interferring relationship with air flow through passageways between blades, the movable means responding to centrifugal force acting thereon when a predetermined rotational speed of the rotor is exceeded, said response resulting in movement of the movable means for the blockage of at least one of the passageways;



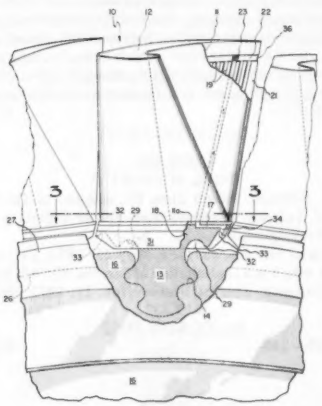
whereby an increase of turbine rotor speed is averted; and wherein the hub is a conical member having the twofold function of serving as a retainer for the movable means as well as spilling flow of a high inlet ram velocity over the blades when the movable means move to the blockage position.

3,856,433

LIQUID COOLED TURBINE BUCKET WITH DOVETAILED ATTACHMENT

Clayton M. Grondahl, Elnora, and John H. Eskesen, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 2, 1973, Ser. No. 384,990
Int. Cl. F01d *5/08*, *5/18*
U.S. Cl. 416—97 **9 Claims**



6. In a gas turbine wherein a turbine disk is mounted on a shaft rotatably supported in a casing, said turbine disk extending substantially perpendicular to the axis of said shaft and having turbine buckets mounted on the outer rim thereof, means located radially inward of said bucket adjacent said turbine disk for supplying liquid coolant to said buckets to enter open-circuit distribution paths comprising cooling channels and a manifold system in each of said buckets, the improvement comprising:

a. each of said buckets having integrally formed airfoil-shaped core, platform and root portions, said root portion

having a dovetailed configuration fitting into a matching slot in said outer rim,

b. the platform portion of each bucket having a pair of longitudinally-extending recesses formed in the underside thereof, one of said recesses extending along each side of, in the same direction as and adjacent said dovetailed configuration, a pair of longitudinally-extending gutters formed in the underside of said platform portion, one of said gutters extending parallel to and adjacent each of said recesses,

c. a pair of longitudinally extending projections formed along the underside of said platform portion, each of said projections separating one recess and one gutter, each of said projections having a crest, said crest being arcuate in cross-section and presenting a convex cylinder surface, the elements of the cylindrical surfaces of both crests being parallel to the elements of the cylindrical convex ridges of said dovetailed configuration and

d. in each of said buckets a plurality of first cooling grooves recessed into the upper surface of the platform portion, said cooling grooves being connected to a plurality of second cooling grooves recessed into the pressure and suction faces of the airfoil-shaped core, said second cooling grooves in turn being connected to a manifold system adapted to discharge coolant from said bucket,

e. skin material disposed over the upper surface of the platform portion and over the pressure and suction faces of each of said buckets thereby covering said first and second cooling grooves and said manifold system except for the exit therefrom,

f. a plurality of holes passing through said platform portion placing said first cooling grooves in flow communication with said pair of gutters and

g. said means for supplying liquid coolant being in flow communication with each of said longitudinally extending recesses,

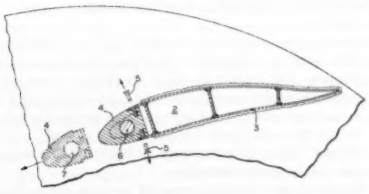
whereby once any given recess has become full of coolant, as additional coolant enters said recess the excess coolant flows over the adjacent crest along the length thereof and passes through said holes, said first and second cooling grooves and said manifold for exit from said bucket.

3,856,434

CENTRIFUGAL FAN WHEEL

Joseph H. Hoffmann, Norwood, Mass., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 18, 1973, Ser. No. 407,725
Int. Cl. F04d *17/16, 29/30*
U.S. Cl. 416—184 **2 Claims**



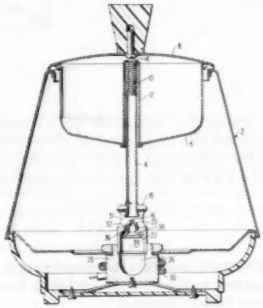
1. A centrifugal fan wheel and blade assembly comprising, a center-plate, a side-plate axially spaced from said center-plate, a plurality of airfoil-type blades to be located between said center-plate and said side-plate, each of said airfoil blades having at least two segments including a nose-piece segment defining the leading edge of said airfoil in the assembled relation, said nose-piece segment being provided with an aperture extending longitudinally through the major axis of said nose-piece from the side-plate to the center-plate and a tail-piece segment defining the trailing edge of said airfoil in the assembled relation, means to permanently secure said tail-piece segment between said center-plate and said side-plate, and means to removably secure said nose-piece segment between said center-plate and said side-plate in the assembled relationship, wherein said removable securing means includes a bolt extending through said aperture and said center- and side-plates.

3,856,435

COFFEE MAKER

Neiland H. Ballard, Ocean Springs, Miss., assignor to M. H. Graham Corporation, Biloxi, Miss.

Filed Nov. 20, 1973, Ser. No. 417,672
Int. Cl. F04b *19/24;* **F04f** *1/18, 9/00*
U.S. Cl. 417—158 **6 Claims**



1. In a beverage infusion appliance having means for holding coffee or other material to be infused, and means including a pump for introducing liquid into the material to be infused, the improvement wherein said pump has a unitary housing provided with an upper portion, a midportion and a lower portion

said upper portion having a longitudinal bore,

said midportion having a transverse bore,

said lower portion having a longitudinal bore intersecting said transverse bore, said lower longitudinal bore is enlarged at its lower end and reduced at its upper end where it intersects said transverse bore, and

a fountain tube affixed to the housing and extending longitudinally through the longitudinal bore in the upper portion of the housing, said fountain tube having an inlet portion positioned in the transverse bore, and

jet means supported in the longitudinal bore of the lower portion of the housing for directing a fluid jet into the inlet portion of the fountain tube to aspirate liquid communicating with the transverse bore upwardly into and through the fountain tube and then into said holding means.

3,856,436

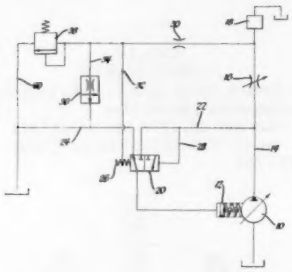
POWER TRANSMISSION

Kurt R. Lonnemo, Troy, Mich., assignor to Sperry Rand Corporation, Troy, Mich.

Filed Dec. 18, 1972, Ser. No. 315,945
Int. Cl. F04b *1/00*
U.S. Cl. 417—212 **4 Claims**

1. A pilot operated load compensated variable displacement pump for maintaining a predetermined pressure drop across an adjustable orifice comprising a servomotor for adjusting the pump displacement, a pilot valve for controlling the servomotor, a connection from the pump output ahead of the adjustable orifice for urging the pilot valve toward a position of lesser pump displacement, a second connection from the pump output beyond the adjustable orifice for urging the pilot valve toward a position of greater displacement, a restrictor in the second connection and a bleed restriction comprising a pressure responsive flow regulator from the restrictor to main-

tain a small and fixed continuous flow therethrough independent of system pressure and sufficient to create a pressure drop through the restrictor several times as great as the pressure drop through the adjustable orifice under steady state conditions, whereby a large pressure differential for operating the pilot valve is available without imposing a large pressure drop in the main flow through the adjustable orifice.



3,856,437

PUMPS

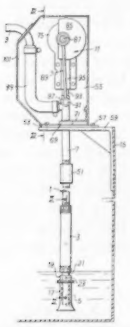
Denis John Allman, and Robert Vincent Seager, both of Chichester, England, assignors to E. Allman & Company Limited, Chichester, Sussex, England

Filed Dec. 7, 1972, Ser. No. 312,897

Claims priority, application Great Britain, Dec. 9, 1971, 57310/71

Int. Cl. F04f *7/00*

U.S. Cl. 417—241 **12 Claims**



1. A portable pump comprising

a body formed with an elongated passage which extends between a liquid inlet and a liquid outlet;

a support for mounting adjacent to a vessel containing the liquid to be pumped which the body is reciprocably mounted,

means mounted on the support for effecting a bodily reciprocation of the body relative to the support so that when the liquid inlet of said body is beneath the liquid in said vessel, said inlet will reciprocate within said liquid,

a valve seat which is disposed in the passage between the inlet and the outlet and spaced from said inlet by a tubular inlet passage of substantially uniform diameter,

a valve member which is movable into and out of engagement with the seat, and

means for retaining the valve member adjacent to the valve seat when the member is disengaged from the seat, said retaining means comprising a spring,

whereby, in use, the body is arranged with the liquid inlet immersed in a liquid and the reciprocating means are operated to reciprocate the body relative to the support so that the passage is alternately moved relative to the liquid in a first sense, which corresponds to a flow of liquid from the inlet towards the outlet and causes disengagement of the valve seat and the valve member against the action of the spring, and in the opposite sense, during which the spring assists in effecting a rapid reengagement of the valve seat and the valve member and a return flow of liquid is prevented or substantially prevented.

3,856,438

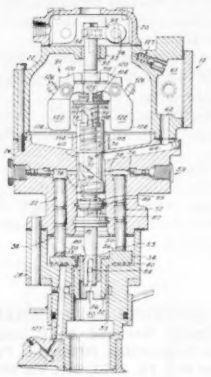
FUEL INJECTION PUMP

Aladar O. Simko, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 26, 1972, Ser. No. 318,297

Int. Cl. F04b *49/00*

U.S. Cl. 417—270 **7 Claims**



1. A fuel injection pump for an air throttled internal combustion engine comprising in combination:

a housing;

fuel supply means communication with the housing;

means forming a plurality of fuel receiving bores within the housing and including fluid discharge communication means between said bores and said engine and further including a plurality of spill passage means for communicating the bores with the fuel supply means;

a plurality of plungers received within the bores in a one-to-one relationship therewith;

a metering valve means arranged to close the spill passage means in a selected sequence;

drive means adapted to be driven by the engine and including means for driving said metering valve to thereby sequentially close said spill passage means in the selected sequence and means for reciprocating said plungers within said bores; and

means responsive to the engine, operable to control the quantity of fuel pumped to the engine by said plungers;

said engine responsive means including speed responsive means within said housing operatively coupled to said metering valve and arranged to controllably vary the phase relationship between spill passage means closure events and engine operation whereby the spill passage

means closure event may be advanced with increasing engine speed over selected ranges of engine operation;

said means for reciprocating the plungers including rotary drive means arranged to engage said plungers, operative upon rotation to reciprocate said plungers within said bores;

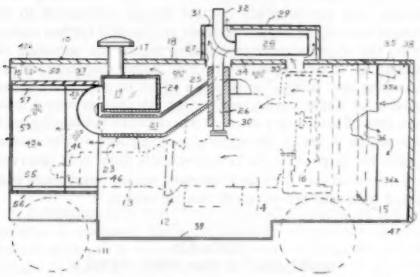
said rotary drive means including a contoured cam actuating surface for engagement with said plungers, the contour of said cam actuating surface being selected to provide plunger displacement velocities which do not decrease for drive means rotational positions corresponding to substantially all possible rotational positions of spill port closure by said metering valve means, whereby the cam actuating surface cooperates with the advance of the metering valve means and the concomitant advance of the spill passage means closure events to provide a fuel delivery characteristic which closely matches the air flow characteristic of the engine over substantially the entire speed range of the engine.

3,856,439

SOUND PROOFED AND AIR COOLED SHELL FOR PORTABLE AIR COMPRESSOR

Rudolf E. Moehrbach, Franklin, Pa., assignor to Chicago Pneumatic Tool Company, New York, N.Y.

Filed June 27, 1973, Ser. No. 374,267
Int. Cl. F04b *39/06*
U.S. Cl. 417—312 **2 Claims**



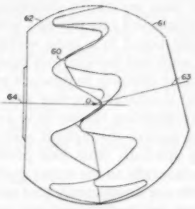
1. A sound proofed and air cooled portable compressor apparatus comprising a box-like shell having a roof, side walls, a front wall and a rear wall, a combustion engine driven air compressor unit confined within the shell provided with cooling radiator means at its forward end and with an engine driven fan located between the engine and the radiator means for drawing cooling ambient air through the radiator means and blowing it over the unit and through the shell, an air inlet chamber defined at the forward end of the shell between the front wall and the radiator means, air intake openings adjacent the front wall formed in the roof and side walls and opening directly onto the chamber for allowing ambient air to be drawn by the suction of the fan into the chamber and through the radiator means, multiple vent openings formed in the rear wall communicating directly into the rear of the shell for allowing exit of air blown by the fan through the shell, the vent openings comprising a plurality of channels extending forwardly partway into the shell, and there being a plurality of acoustic sound attenuating panels arranged in the rear area of the shell parallel to each other and to the longitudinal axis of the shell and defining the channels, the direction of movement of the ambient air drawn into the chamber being linearly from the chamber at the front end of the shell to the vent openings at the rear end of the shell.

3,856,440

ROTOR PAIR FOR POSITIVE FLUID DISPLACEMENT

Ernest Wildhaber, 124 Summit Dr., Brighton, N.Y. 14620

Filed Mar. 19, 1974, Ser. No. 452,508
Int. Cl. F01c *1/08*; **F03c** *3/00*; **F04c** *17/04*
U.S. Cl. 418—195 **12 Claims**



1. A pair of rotors adapted to run on intersecting axes, having intermeshing teeth to provide fluid displacement and having tooth numbers differing by one tooth, said rotors having tooth-top portions of convex profiles in planes perpendicular to the tooth direction, one rotor of said pair having its entire tooth surfaces formed conjugate to the tooth-top portion of the other rotor,

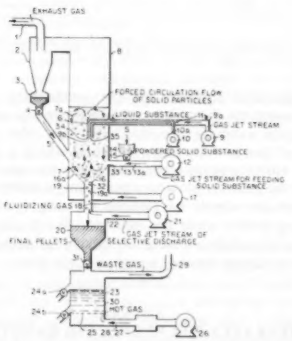
the tooth addendum at mid-face of said other rotor being algebraically smaller than the curvature radius of its said profile at its mid-point, so that the curvature center is displaced from the pitch surface towards the tooth bottom.

3,856,441

APPARATUS FOR PELLETIZING POWDERED SOLID SUBSTANCE IN A FLUIDIZED BED

Yuichi Suzukawa; Hisashi Kono, and Atushi Kuribayashi, all of Ube, Japan, assignors to UBE Industries, Ltd., Ube-shi, Yamaguchi-ken, Japan

Continuation of Ser. No. 85,611, Oct. 30, 1970, abandoned, which is a continuation of Ser. No. 839,749, April 15, 1969, abandoned, which is a continuation-in-part of Ser. No. 554,082, May 31, 1966, abandoned. This application Nov. 3, 1972, Ser. No. 303,304
Int. Cl. B22d *23/08*
U.S. Cl. 425—7 **9 Claims**



1. Apparatus for pelletizing a powdery solid substance by causing agglomeration to produce pellets of a predetermined minimum size, the combination of, a fluidizing vessel enclosing a fluidizing zone comprising side walls surrounding the periphery of said zone and a bottom wall structure defining the bottom of said zone, said vessel having a bottom pellet-discharge opening and said bottom wall structure extending

downwardly toward said opening from said side walls at an acute angle to the horizontal, said bottom wall structure having gas-discharge openings for fluidizing gas, means to supply fluidizing gas through said gas discharge openings, means providing a vertical passageway extending upwardly to and concentric with said pellet-discharge opening, means directing a stream of fluidizing gas upwardly through said passageway at a controlled rate, means for delivering the powdery solid substance at a controlled rate into said vessel, means to deliver an agglomerating liquid to a zone within said vessel remote from said side walls and bottom wall structure, said stream of fluidizing gas being effective to produce an upward flow of gas from said pellet discharge opening and said first-mentioned fluidizing gas cooperating therewith to produce and maintain a fluidizing gas pattern throughout said fluidizing zone with the flow being upwardly from said pellet-discharge opening and thence horizontally to the upper portion of said side wall structure and thence downwardly past said side wall structure and thence along said bottom wall structure generally toward said pellet-discharge opening to complete the path, whereby the powdery solid substance and said liquid are entrained into said fluidizing gas and the liquid wets and agglomerates the powdery solid substance to form pellets the size of which is increased by surface wetting and contact with additional fragments of the solid substance, said stream of fluidizing gas flowing upwardly through said passageway at a controlled rate such that pellets which are smaller than said minimum size are carried upwardly into said fluidized zone and pellets of said minimum size are discharged through said passageway by the action of gravity.

3,856,442

DISPERSION OF MATERIALS IN THERMOPLASTICS

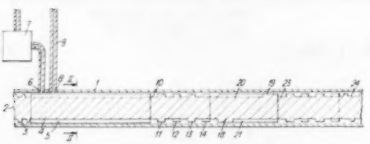
Brendan Gallagher, Welwyn, and Anthony Graham Marshall Last, Welwyn Garden City, both of England, assignors to Imperial Chemical Industries, Limited, London, England

Division of Ser. No. 189,135, Oct. 14, 1971, Pat. No. 3,787,542. This application Sept. 4, 1973, Ser. No. 394,397

Claims priority, application Great Britain, Oct. 19, 1970, 49447/70

Int. Cl. B29d *27/00*

U.S. Cl. 425—4 C **12 Claims**



1. Apparatus suitable for the production of extruded foamed synthetic thermoplastic polymeric materials comprising a screw extruder provided with two inlet ports, downstream of the melting zone, through which a liquid and a gaseous blowing agent respectively may be injected, the inlet port for the gaseous blowing agent being connected to a constant pressure supply of gaseous blowing agent via a flow restricting device while the inlet port for the liquid blowing agent is connected to a metering device for delivering a given quantity of liquid blowing agent per unit time.

3,856,443

APPARATUS FOR PRODUCING CANDYFLOSS

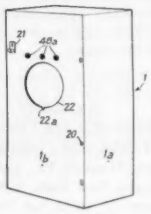
Attilio A. Salvi, Asnieres, France, assignor to General Properties Anstalt, Vaduz County, Liechtenstein

Filed Aug. 6, 1973, Ser. No. 385,711

Int. Cl. A23g *3/20*

U.S. Cl. 425—9 **8 Claims**

1. In apparatus for producing the sugary confectionery called "candyfloss" and consisting of filaments of sugar attached to and wound around a small stick such apparatus comprising a framed housing; a circular trough mounted interiorly of this framed housing with its axis vertical; a rotary hollow drum located coaxially in said trough with its axis vertical; means mounting said drum for rotation about said vertical axis; heating means operative to maintain the interior of said drum at an elevated temperature; a feed opening in the upper wall of said drum; outlet orifice means for the sugar filaments and formed in the lateral peripheral wall of said drum; sugar container means disposed in said housing; a dispensing tube communicating said sugar container means with said feed opening of the rotary drum; a sugar dispenser interposed between said sugar container means and the dispensing tube; a control unit operatively associated with said sugar dispenser; a drive motor disposed coaxially of the rotary drum



and beneath the trough; an output shaft of said drive motor passing through said trough and attached to the rotary drum; further control units effective to control said drive motor and heating means said further control units including timer means; and pre-payment control means connected to the control unit of the sugar dispenser and to said further control units; the improvement comprising means for adjusting the volume of sugar dispensed by said sugar dispenser; means mounting said trough for rotation about its axis; drive means capable of imparting to said trough an angular speed lower than that of said rotary drum; a reservoir for containing sticks onto which in use of the apparatus candyfloss will be wound; means for dispensing sticks individually from said reservoir; and a control unit for said dispensing means operatively associated with said pre-payment control means.

3,856,444

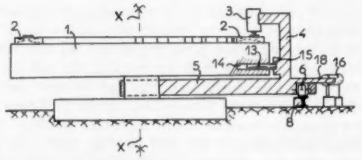
SHORT-CYCLE MOLDING DEVICE

Jean Louis Saltel, Quai du Mas d'Hours, 30100 Ales, France

Filed Oct. 5, 1972, Ser. No. 295,268

Int. Cl. B29c *5/00*

U.S. Cl. 425—60 **10 Claims**



1. Apparatus for rapid cyclic molding of a quick setting fluid material such as polyurethane, said apparatus comprising a carrousel mounted for rotation about a vertical axis, means for continuously rotating said carrousel about said vertical axis, said carrousel including a circular table and a series of molds on said table at the periphery thereof, covers for said molds, radial arms pivotably supported on said carrousel and carrying said covers, means for pivoting said arms to move said covers and open said molds during a material pouring operation and close said molds during setting of the material, and a pair of abutments corresponding to each mold and fixed at the pe-

riphery of said table; a movable assembly mounted for pivotable movement around said vertical axis below said table and including at least one pouring head extending at a level above said molds for introducing said material into the molds entrainment means for driving said movable assembly by said carrousel over a limited path of annular travel, and means for reciprocally moving the pouring head above a corresponding mold during the pouring operation, said entrainment means comprising a radial finger supported from said movable assembly for radial movement between extended and retracted positions, said finger in the extended position engaging one of said abutments to drive said movable assembly and in the retracted position being free from said abutments to permit the movable assembly to return to an initial position.

3,856,445

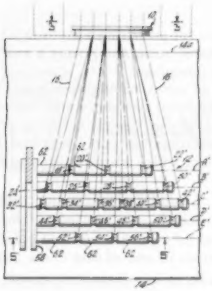
SPINNERET WITH YARN SEPARATOR

David W. Norwood, Baltimore, Md., assignor to Concorde Fibers, Inc., Columbia, Md.

Continuation of Ser. No. 216,172, Jan. 7, 1972, abandoned. This application July 31, 1973, Ser. No. 378,363

Int. Cl. D01d 7/00

U.S. Cl. 425—71 **6 Claims**



1. A spinning apparatus for extruding polymeric yarn which includes a spinneret having a plurality of grouped spinning orifices arranged in rows there being several grouped spinning orifices in each row, the polymer being extruded into filaments through said spinning orifices issuing from the spinneret, and a yarn separator cooperating with said spinneret for separating the filaments extruded from the respective groups of orifices into respective yarn ends, said yarn separator comprising a plurality of substantially parallel separator bars, each separator bar having a plurality of spaced guide means for guiding the yarn ends, the guide means on each separator bar in addition to being spaced from each other being also staggered with respect to the guide means on the other separator bars such that each guide means receives yarn from only one of the grouped spinning orifices, whereby the yarn ends of each of the grouped spinning orifices are guided to and away from the yarn separator in a spaced relationship.

3,856,446

LEAD EXTRUSION DEVICE WITH MEANS FOR REMOVING A DIE MEMBER WITHOUT INACTIVATING THE MATERIAL FEED MEANS

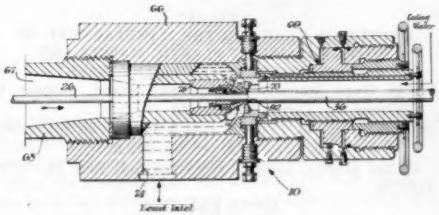
John J. Schultz, Wilmington, Del., assignor to Electric Hose & Rubber Company, Wilmington, Del.

Continuation of Ser. No. 136,720, April 23, 1971, abandoned. This application Mar. 20, 1973, Ser. No. 343,132

Int. Cl. B29f 3/10

U.S. Cl. 425—113 **10 Claims**

1. An extrusion device for extruding a jacket around an elongated tube comprising a die block body, a longitudinal passageway extending completely through said die block body, a female die in said passageway, a male die assembly in said passageway disposed adjacent said female die and slightly spaced therefrom, said male die assembly including a die insert facing said female die, an extrusion die tip removably engaged to said die insert and projecting therefrom disposed adjacent said female die, feed means for feeding jacket making material around said die insert and between said extrusion die tip and said female die whereby a tube may pass through said die block body and have a jacket extruded thereon, the downstream edge of said die insert being disposed sufficiently close to said female die to act as a male die when said die tip is removed therefrom, the opening in said female die being at least substantially the same size as the opening in said die insert left when said die tip is removed therefrom, said device having a longitudinal passage exposed at the upstream end of



saidi device remote from said female die and of a size sufficient for said extrusion die tip to be movable therein, removal means for completely removing said extrusion die tip through said passage by manipulation externally of said device without inactivating said means for feeding said jacket making material and without interrupting the flow of material around said die insert, said removal means including a temporary tool locking member connected to said extrusion die tip for joint movement and for temporarily having a manipulating tool locked thereto, said tool locking member being wholly within said passage and terminating remote from the open upstream end of said device, said tool locking member having tool reception means at its rear edge remote from said open end of said device whereby said extrusion die tip may be manipulated externally of said device by insertion of a manipulating tool into said passage for engagement with said tool locking member to disengage said extrusion die tip from said die insert and to withdraw said extrusion die tip from said passage, and said tool locking member having means to hold it in place against axial movement within said passage when the manipulating tool is disengaged therefrom.

10. An extrusion device for extruding a jacket around an elongated tube comprising a die block body, a longitudinal passageway extending completely through said die block body, a female die in said passageway, a male die assembly in said passageway disposed adjacent said female die and slightly spaced therefrom, said male die assembly including a die insert facing said female die, an extrusion die tip removably engaged to said die insert and projecting therefrom disposed adjacent said female die, feed means for feeding jacket making material around said die insert and between said extrusion die tip and said female die whereby a tube may pass through said die block body and have a jacket extruded thereon, said die block body having a longitudinal passage exposed at the upstream end of said device remote from said female die and of a size sufficient for said extrusion die tip to be movable therein, removal means for removing said extrusion die through said die block body passage by manipulating externally of said device without inactivating said means for feeding said jacket making material and without interrupting the flow of material around said die insert, and said removal means including temporary tool locking member connected to said extrusion die tip for joint movement and for temporarily having a manipulating tool locked thereto, said tool locking member being wholly within said passage and terminating remote from the open upstream end of said device, said tool locking

member having tool reception means at its rear edge remote from said open end of said device whereby said extrusion die tip may be manipulated externally of said device by insertion of a manipulating tool into said passage for engagement with said tool locking member to disengage said extrusion die tip from said passage, said tool locking member having means to hold it in place against axial movement within said passage when the manipulating tool is disengaged therefrom, said means for preventing axial movement of said tool locking member including a locking sleeve mounted in said die insert and having camming means, and follower means on one of said locking tool member and extrusion die for riding against said camming means.

3,856,447

EXTRUSION HEAD FOR THE MANUFACTURE OF HOSES FORMED OF PLASTIC MASSES AND CONTAINING REINFORCEMENT INSERTS

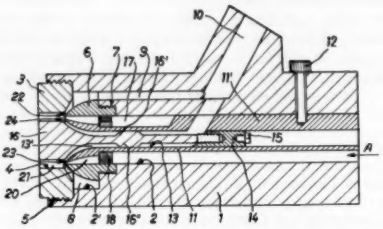
Walter Hugo Schiesser, Zurich, Switzerland, assignor to Schiesser AG, Zurich, Switzerland

Division of Ser. No. 151,418, June 9, 1971,. This application June 26, 1973, Ser. No. 373,651

Claims priority, application Switzerland, June 16, 1970, 9100/70

Int. Cl. B29f *3/10*

U.S. Cl. 425—114 9 Claims



1. An extrusion head arrangement for manufacturing hoses formed of rubber or other plastic masses and containing pre-formed, solid reinforcement inserts, comprising an extrusion head housing, means providing an inlet for plasticized hose forming material at said housing, said housing being provided with means defining a pair of compartments in communication with said inlet, an extrusion opening arranged at the outlet side of said housing, an outlet provided for each of said compartments, each said outlet possessing a substantially ring-shaped outlet opening, said outlet openings being located concentrically with respect to one another in front of the inlet to said extrusion opening, discharge means opening into said openings of the compartments, and guide means within said housing for reinforcement material introduced into the housing in order to guide such pre-formed, solid reinforcement material in a predetermined spatial arrangement out of an annular gap defining said discharge means into said extrusion opening, said extrusion head arrangement being adapted to simultaneously and separately inject plasticized material from each of said outlet openings against both the inside and outside of said pre-formed, solid reinforcement material to thereby form said hoses.

3,856,448

MULTI-CORE CIRCULAR DIE FOR PREPARING MULTI-LAYER TUBULAR FILM

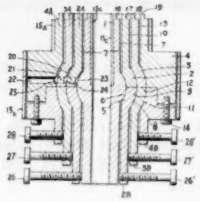
Akira Iijima; Yujiro Yokoyama, both of Yokohama; Yosuke Yamada, Tokyo, and Makoto Kimura, Yokohama, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinanyo-shi and The Japan Steel Works, Limited, Tokyo, both of, Japan

Filed Dec. 29, 1972, Ser. No. 319,283

Claims priority, application Japan, Dec. 29, 1971, 47-3069

Int. Cl. B29f *3/00*

U.S. Cl. 425—133.1 11 Claims



1. Apparatus for preparing a multi-layer tubular film made of a thermoplastic resin comprising a multi-core circular die which in turn comprises:

a plurality of cores having concentric tube portions and central spherical portions which are rotatably fitted with each other at said central spherical portions;

a housing surrounding said cores and having a spherical inner surface which rotatably secures said cores together; and

a plurality of tubular passages for conducting the flow of said resin which are disposed within spaces formed between said tube portions of said cores and between said tube portions of one of said cores and said housing.

3,856,449

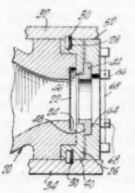
MEANS FOR HIGH SPEED TRIMMING OF SOAP EXTRUSIONS

Charles F. Fischer, Jersey City, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 24, 1972, Ser. No. 308,954

Int. Cl. B28b *11/16;* B29c *17/10*

U.S. Cl. 425—308 7 Claims



1. A wire trimmer assembly for a soap plodder including a housing for levigating and homogenizing a mass of soap, said housing terminating in an outlet for roughly extruding said mass of soap, said assembly comprising a nozzle plate holder detachably secured to said housing outwardly of said outlet, a nozzle plate overlying said nozzle plate holder and downstream of said outlet for closely shaping said mass, a wire cutting head outwardly and downstream of said nozzle plate, said nozzle plate holder having a bore therethrough said nozzle plate having a barrel portion seating in said bore and a flange portion of larger diameter than said bore between said nozzle plate holder and said wire cutting head, said nozzle plate having a rectangular die opening therein, and means for

securing said wire cutting head to said nozzle plate holding said nozzle plate therebetween.

2. A wire trimmer assembly for a soap plodder including a housing for levigating and homogenizing a mass of soap, said housing terminating in an outlet for roughly extruding said mass of soap, said assembly comprising a nozzle plate downstream of said outlet for closely shaping said mass of soap, a nozzle plate holder, a wire cutting head downstream of said nozzle plate, fastening means for detachably securing said wire cutting head to said nozzle plate holder, said nozzle plate holder having a bore therethrough, said nozzle plate having a barrel portion seating in said bore, said nozzle plate having a rectangular die opening therein, and bayonet means for detachably securing said nozzle plate holder to said housing with said nozzle plate being inwardly of said wire cutting head.

3,856,450

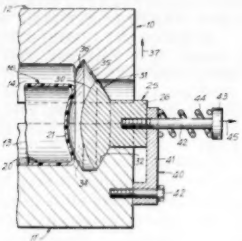
MOLD CONSTRUCTION

George C. Britten, Massapequa, N.Y., assignor to Manbritt Industries, Inc., Amityville, N.Y.

Filed Nov. 6, 1972, Ser. No. 304,193

Int. Cl. B29d *23/03*

U.S. Cl. 425—398 **8 Claims**



1. A mold construction having a pair of separable complementary hollow mold parts combining to define a cavity for formation therein of a molded article, and wherein said mold parts having draft of unobstructed withdrawal away from each other and a molded article, comprising: a plug carried by one of said mold parts for movement into and out of said cavity for forming an external recess in a molded article when said plug is in its inwardly projecting position in said cavity, resilient means fixed to said one of said mold parts urging said plug toward its outwardly projecting position out of said cavity so as not to obstruct said mold part withdrawal, and cooperating means on said plug and the other of said mold parts to shift said plug to its inwardly projecting position in said cavity against said resilient means upon mold part movement toward each other for forming said recess in a molded article.

3,856,451

DEVICE FOR PRODUCING MOLDINGS FROM FOAMABLE PLASTICS, MORE PARTICULARLY, POLYURETHANE

Karl Holzinger, Herford-Schwaren-moor, Germany, assignor to Herbert Kannegiesser Kommandilgesellschaft of Hollwiesen, Vlotho, Germany

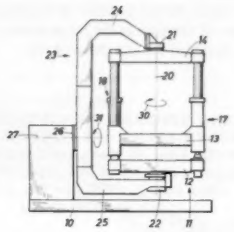
Filed May 24, 1973, Ser. No. 363,698

Claims priority, application Germany, May 26, 1972, 7219751

Int. Cl. B29c *5/04*

U.S. Cl. 425—429 **2 Claims**

1. In a device for producing moldings from foamable plastics, more particularly, polyurethane, wherein a two-part mold is arranged in a mold support pivotable about at least a first axis disposed in the direction of closing of the mold and about a second axis arranged at right angles to the first axis in the center of concentration of the mold support and wherein the two ends of the first axis pass through the arms of a U-shaped bow which is disposed about the mold support and mounted on the frame on its rear stem side along the line of the second axis, the improvements comprising the mold support (**11**) has a table-shaped clamping plate (**12**), a pressure yoke (**13**), a a traverse bar (**14**), and two guide and displacement devices



(17,18) for the pressure yoke (**13**); said guide and displacement devices (**17,18**) being arranged opposite each other in an off-set position approximately along the line of a diagonal (**19**) of the clamping plate (**12**) and the guide rods (**28,29**) of the guide and displacement devices (**17,18**) interconnecting the clamping plate (**12**) and the traverse bar (**14**).

3,856,452

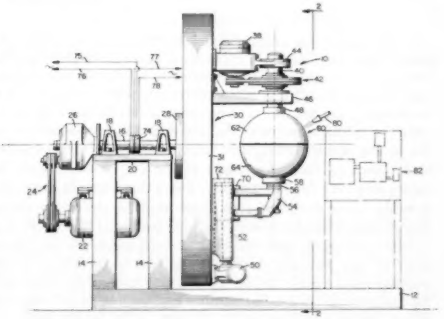
APPARATUS FOR CENTRIFUGALLY CASTING HOLLOW SPHERES

Juan Jose Amado, Jr., Aptdo. 4241, Panama 5, Panama

Filed Nov. 5, 1973, Ser. No. 412,614

Int. Cl. B29c *5/04*

U.S. Cl. 425—429 **8 Claims**



1. An apparatus for centrifugally casting hollow spheres from molten material comprising

a. frame means for supporting shaft bearing means,

b. a first drive shaft rotatbly held in said shaft bearing means,

c. first electric motor means for rotating said first drive shaft,

d. rotating platform means coupled to said first drive shaft for rotation by said first electric motor mean,

e. second electric motor means mounted on said rotating platform means,

f. slip ring means to supply electric power to said second electric motor means,

g. a second drive shaft driven by said second electric motor means,

1. said second drive shaft being at right angles to said first drive shaft and in a common plane therewith,

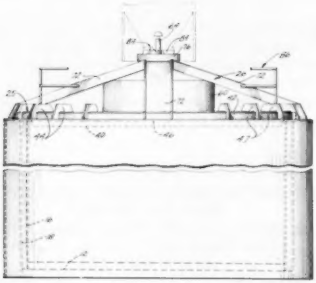
h. first clamping means rotatable by said second drive shaft,
i. second clamping means rotatable on shaft means in line with said second drive shaft,
j. means to advance and retract at least one of said clamping means,
k. and mold means clamped by said first and second clamping means,
l. said mold means capable of being positioned with its center of rotation at the intersection of the axes of said first first and second drive shafts.

3,856,453

FACING RING AND POURING CHUTE FOR VERTICALLY CAST CONCRETE PIPE

Frank M. Wells, Aztec, N. Mex., and Gordon J. Black, Nuevo, Calif., assignors to Ameron, Inc., Monterey Park, Calif.

Filed Aug. 2, 1973, Ser. No. 385,189
Int. Cl. B28b *21/04*
U.S. Cl. 425—447 **6 Claims**



1. Apparatus for casting concrete pipe in a vertically disposed pipe mold having a cylindrical outer mold case, and an inner cylinder disposed concentrically inside the outer mold case to form an annular mold cavity into which concrete is to be poured, the apparatus comprising a flat facing ring encircling the cylinder and mounted above the annular mold cavity, the facing ring including gate means capable of being opened and closed to control passage of the concrete through the facing ring into the mold cavity, and a downwardly extending pouring chute mounted in a fixed position above the facing ring in communication with the gate means of the facing ring so that concrete poured onto the pouring chute will be distributed by the pouring chute through the gate means to the annular mold cavity, the facing ring providing a flat undersurface which will form a flat annular end section of the cast pipe when concrete is filled to the bottom of the facing ring.

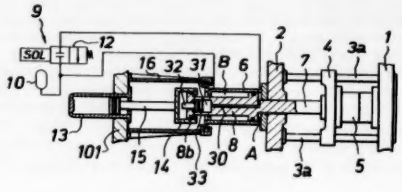
3,856,454

ROTARY TYPE INJECTION MOLDING MACHINE

Katashi Aoki, 6037, Oaza Minamijo, Sakaki-machi, Hanishina-gun, Nagano-ken, Japan

Division of Ser. No. 171,914, Aug. 16, 1971, Pat. No. 3,806,296. This application June 5, 1973, Ser. No. 367,261
Claims priority, application Japan, Aug. 29, 1970, 45-75442; Aug. 29, 1970, 45-75443
Int. Cl. B29f *1/06*
U.S. Cl. 425—451 **1 Claim**

1. A rotary type injection molding machine having a mold pressurizing device, wherein a fluid circulating path having an accumulator for storing one part of the pressurized fluid and valve means for blocking the fluid path is provided for a pressurizing cylinder including a piston integrally connected to a mold operating rod, a pressure reducing cylinder communicating with a chamber located at the mold operating rod side of the pressurizing cylinder is provided inside of said piston at one end thereof, and said pressure reducing cylinder includes



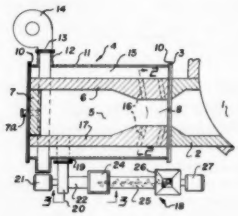
a pressure reducing piston operable by a mold opening-and-closing device of the injection molding machine.

3,856,455

METHOD AND APPARATUS FOR MIXING AND TURBULATING PARTICULATE FUEL WITH AIR FOR SUBSEQUENT COMBUSTION

Clifford G. Otway, 3023 Larchway, Port Coquitlam, and Barry D. Biden, 1350 W. 70th, Vancouver, both of Canada

Filed Jan. 29, 1973, Ser. No. 327,821
Claims priority, application Canada, Feb. 1, 1972, 133611
Int. Cl. F23d *11/44;* **F23l** *15/00*
U.S. Cl. 431—11 **14 Claims**



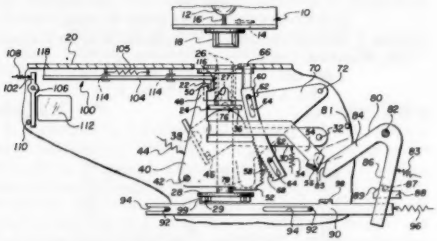
1. Apparatus for generating and igniting a fuel mixture stream comprised of an intimate mixture of air and particulate fuel, comprising
an elongated chamber having an inlet at one end and a restricted outlet at the other end,
a duct connected axially to the inlet of the chamber for entraining particulate fuel in a stream of primary air in a proportion and at a temperature insufficient to permit significant combustion of the fuel in the chamber, and for injecting the resultant mixture into the chamber, said chamber being constructed to exclude any other air therefrom,
means in said duct for generating turbulence in the chamber to create a thorough mixing of the fuel and primary air therein as the mixture moves therethrough towards the outlet,
means for maintaining ignition of the suspension in the region of the outlet,
and means for directing a stream of secondary air into confluence with the turbulent suspension in the region of said outlet to provide, together with the primary air sufficient air to support complete combustion of the fuel suspended in the air, said directing means being such as to cause the secondary air to assist in moving said mixture through the chamber.

3,856,456

DEAD BULB SENSING MECHANISM

David Easton Beach, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 3, 1973, Ser. No. 402,954
Int. Cl. F21k 5/02
U.S. Cl. 431—92 9 Claims



1. For use with a flash unit having a plurality of flashlamps fireable by striking; a striker associated with each flashlamp and releasable from a pre-energized condition to effect such striking; and means defining an access opening providing access to such a pre-energized striker; photographic apparatus comprising:

means for receiving such a flash unit with one of the flashlamps located in a predetermined firing position relative to said photograhic apparatus;

means for rotating said receiving means to position another of the flashlamps at the predetermined firing position;

means, including a sensing member movable through an access opening in the flash unit, for sensing the presence or absence of a pre-energized striker associated with the flashlamp located at the predetermined firing position;

means responsive to movement of said sensing member for indicating the presence or absence of a pre-energized striker;

first withdrawing means for withdrawing said sensing member from the access opening in rsponse to rotation of said receiving means; and

second withdrawing means, responsive to operation of said rotating means, for withdrawing said sensing member from the access opening prior to its withdrawal by said first withdrawing means.

3,856,457

BURNER OF THE OXY-FUEL TYPE

Keith A. Miller, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

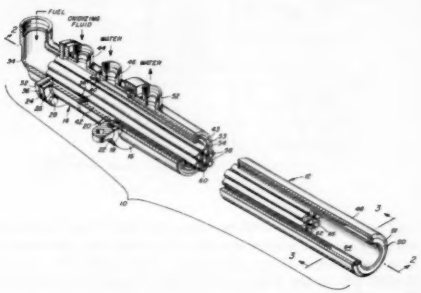
Filed Dec. 29, 1972, Ser. No. 319,493
Int. Cl. F23d 15/02
U.S. Cl. 431—353 12 Claims

1. A burner of the oxy-fuel type comprising in combination: an elongated generally cylindrical housing having an outer wall and an inner wall with internal fluid cooling passages, said housing defining on one end thereof an opening for producing a flame;

means for introducing to and removing fluid from said internal fluid cooling passages;

a plurality of elongated tubes disposed within said housing, defining a bundle compacted by the inner wall of said housing with the axis of each tube generally parallel to the axis of the other tubes, each of said tubes being spaced apart from the other tubes in said bundle and so constructed and arranged to define a first longitudinal fluid passage having a total cross-sectional area comprising the sum of the individual cross-sectional areas defined by the outside surfaces of adjacent tubes and the outside surfaces of said tubes and the adjacent housing surface said passage being coextensive with the tube bundle, a second longitudinal fluid passage having a cross-sectional area defined by the sum of the cross-sectional areas defined by the bore of each tube in said bundle, said bundle being spaced inwardly from the opening in the housing for producing a flame thereby defining a generally cylindrical combustion chamber;

means for introducing a first fluid through the passage defined by the bores of said tubes to said combustion chamber;



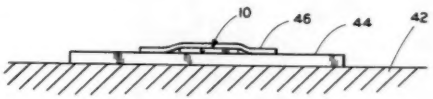
means for introducing a second fluid into the passage defined by the outside surfaces of the tubes in the tube bundle for mixing with the first fluid in the combustion chamber to provide a flame directed outwardly of said housing, said first and second fluids being either a fuel or an oxidizing fluid.

3,856,458

METHOD AND APPARATUS FOR HEAT SOFTENING PLASTIC ARTICLES

Harry Greenwald, Chicago, Ill., assignor to Craftics, Inc., Chicago, Ill.

Filed Apr. 30, 1973, Ser. No. 355,634
Int. Cl. F27b 9/28
U.S. Cl. 432—5 5 Claims



1. A method of applying heat along a predetermined path on a surface of a plastic article, comprising the steps of directing heat through an intervening limited thermal barrier along said predetermined path and in direct contact with said surface of said plastic article, convering said limited thermal barrier with a further thermal barrier, and maintaining the direction of said heat for a predetermined period of time to obtain localized softening of said article immediately below the surface of said limited thermal barrier.

3,856,459

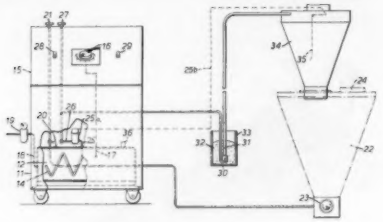
HEATERS

Dennis Frederick Bourton, Canterbury, England, assignor to Canterbury Precision Engineering Limited, Canterbury, Kent, England

Filed July 19, 1973, Ser. No. 380,843
Claims priority, application Great Britain, July 27, 1972, 35125/72
Int. Cl. F27b 15/00
U.S. Cl. 432—58 4 Claims

1. A device for heating and conveying bulk material which comprises: a gas heater including a pressure vessel having inlet means and outlet means, said inlet means being arranged to be connected to a source of pressurized gas, and electrical heat-

ing means located within said pressure vessel for heating said gas therein; and a bulk material conveyor system including an inlet hopper having a lower end and adapted to receive and dispense bulk material and a pneumatic conveyor pipe adapted to convey bulk material from a source to said hopper;



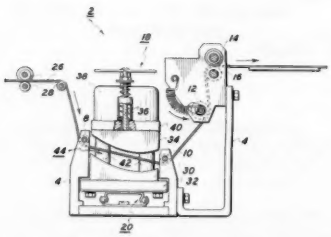
said outlet means including means for delivering heated pressured gas to said pneumatic tube for preheating and conveying said bulk material to said hopper and means for delivering heated gas to the lower end of said hopper for heating bulk material therein.

3,856,460

DEVELOPING SYSTEM FOR FILM BY ADIABATIC HEAT FLOW

Frank R. Hynes, Rochester; Joseph N. May, Webster, and David H. Thompson, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 23, 1973, Ser. No. 418,719
Int. Cl. F27b *9/28*
U.S. Cl. 432—59 **6 Claims**



1. Developing apparatus for processing a web of dry film having a heat developable emulsion on one side of a support material, including:

a frame to support and guide a web of film in tension along a film path,

a developing station movably mounted on said frame and operatively connected to a drive means for reciprocating movement along a first axis between a standby position and an operative position relative to said film path,

said developing station including a pair of heatable platens having substantially mating facing surfaces defining a cavity therebetween and actuator means to effect reciprocating movement of one of said platens relative to the other of said platens along a second axis to respectively close and open said cavity,

said platens being disposed one on each side of said film when said developing station is in its operative position relative to said film path, said platens being out of contact with said film when said cavity is open, and one of said platens being in contact with the side of said film opposite said emulsion when said cavity is closed, and

control means interconnecting said drive means and said actuator means to interdependently control:

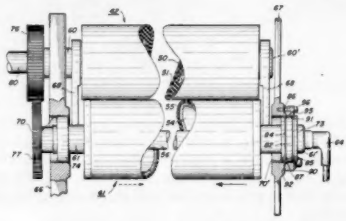
1. said drive means to move said developing station to and from its operative position relative to said film path, and
2. said actuator means to open and close said cavity.

3,856,461

REPRODUCTION MACHINE FUSER

William E. Jordan, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 18, 1973, Ser. No. 407,682
Int. Cl. G03g *5/00;* **H05b** *3/10*
U.S. Cl. 432—60 **5 Claims**



1. In a reproduction machine for producing copies of documents, the machine including a fuser for fixing the copy images developed, the fuser having cooperating pressure and heated fusing rolls forming therebetween a nip through which the copies to be fused pass, the improvement comprising:

bearing means supporting said fuser roll for rotation, said bearing means being movable in an axial direction to permit said fuser roll to be shifted axially relative to said pressure roll whereby to offset spot wear on the surface of said fuser roll; and

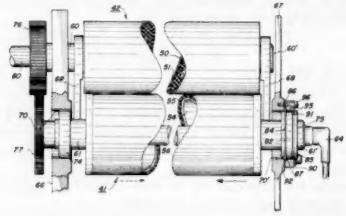
locking means for releasably locking said bearing means and said fuser roll in selected position.

3,856,462

REPRODUCTION MACHINE FUSER

Karl J. Mueller, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 18, 1973, Ser. No. 407,683
Int. Cl. G03g *5/00;* **H05b** *3/10*
U.S. Cl. 432—60 **4 Claims**



1. In a reproduction machine for producing copies of documents, said machine having a fuser for fixing the copy images developed, said fuser having cooperating pressure and heated fusing rolls forming therebetween a nip through which copies to be fused pass, the improvement comprising

means supporting said fusing roll for a shift in an axial direction relative to said pressure roll from one relatively permanent operating position to a second relatively permanent operating position whereby to permit the surface of said fusing roll to be displaced to a new position rela-

tive to said pressure roll to offset uneven wear on the surface of said fusing roll.

3,856,463

INCLINED FURNACE FOR CALCINATION AND SINTERING OF MATERIAL PARTICULARLY SPLINT LIMESTONE

Karl Beckenbach, Meererbusch 1. Eschenweg 2, Dusseldorf, Germany

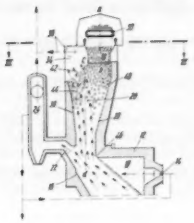
Filed Sept. 28, 1973, Ser. No. 401,698

Claims priority, application Germany, Sept. 29, 1972, 2247785

Int. Cl. F27b *1/00*

U.S. Cl. 432—96 **4 Claims**

1. A furnace for calcining and sintering material, particularly split-limestone material, comprising a firing chamber defined by a slopping hearth having upper and lower ends, a dome-like roof, lateral walls and a wall opposite said hearth; at least one burner located in said chamber wall opposite said hearth; means defining orifice means adjacent said upper end of said hearth; a recuperator connected to said firing chamber through said orifice means; vertical inlet and outlet shafts for material to be treated located at said ends of said hearth and laterally staggered relative to each other, each said shaft being defined by a pair of opposed long walls and a pair of opposed short walls, at least said long walls of said inlet shaft diverging upwardly above said orifice means, and said long and short walls of said inlet shaft defining an inlet shaft top opening having opposed lateral portions; a pre-silo arranged to discharge material into one of said lateral portions of said inlet shaft opening; a gas collection chamber arranged in the other of said lateral portions of said inlet shaft opening, said other



lateral portion of said inlet shaft opening being on that side of the inlet shaft nearest said recuperator, and said inlet shaft forming a slopping surface at a level below said pre-silo for material issuing from said pre-silo; and a chimney communicating with said gas collection chamber.

3,856,464

METHOD OF MODIFYING KERATINOUS TEXTILES AND FIBRES AND PRODUCTS OBTAINED

Bryan Dobinson, Duxford, and Kenneth Winterbottom, Whittlesford, both of England, assignors to Ciba-Geigy AG, Basle, Switzerland

Continuation of Ser. No. 205,398, Dec. 6, 1971, abandoned. This application Aug. 31, 1973, Ser. No. 393,693

Claims priority, application Great Br'tain, Dec. 10, 1970, 58787

Int. Cl. D06m *3/00*

U.S. Cl. 8—127.5 17 Claims

1. A process for modifying keratinous material which comprises

1. treating the material with a polyurethane or polythiourethane containing at least two mercaptan (-SH) groups per molecule, and
2. curing the polyurethane or polythiourethane on the material.

3,856,465

LEAK DETECTION COATING FOR AIRCRAFT FLEXIBLE FUEL CELLS

David J. Lipscomb, Smyrna, Ga., assignor to Lockheed Aircraft Corporation, Los Angeles, Calif.

Filed May 17, 1973, Ser. No. 361,239

Int. Cl. G01n *21/16*

U.S. Cl. 23—230 L 7 Claims

1. A leak detection coating for flexible fuel cells in aircraft comprising a batch of homogeneous mixture stored in an air-tight container until ready for use, said mixture consisting essentially of equal parts of a solvent and rubber cement and approximately 1 to 1.2 ounces per gallon of coating desired of an oil soluble dye selected from the AZO and Anthraquinone types.

3,856,466

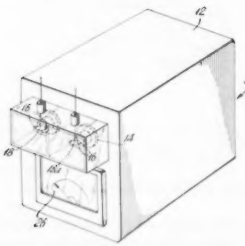
FLUID IMPURITY ANALYZER

Harry M. Crawford, Port Murray, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation of Ser. No. 103,766, Jan. 4, 1971, abandoned. This application May 3, 1972, Ser. No. 250,086

Int. Cl. G01n *29/02*, *33/18*

U.S. Cl. 23—230 R 11 Claims



1. A method for determining the organic impurity content in a fluid comprising the steps of:

a. mixing a sample of said fluid with an organic solvent, whereby a two-phase liquid mixture is formed including an impurity-containing organic phase;
b. extracting a sample of the organic phase containing the organic impurity;
c. disposing an amount of the extraced sample on at least a first crystal having a predetermined resonant frequency and operably connected with first oscillator circuit means;
d. providing second oscillator circuit means having a predetermined resonant frequency; and
e. determining the amount of organic impurity in said organic solvent as a function of the difference in frequency between said first and second oscillator circuit means.

3,856,467

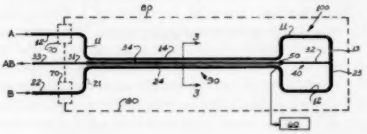
CUMULATIVE THERMAL DETECTOR

Patrick Picker, Sherbrooke, Quebec, Canada. Assignor: Universite de Sherbrooke

Filed June 5, 1972, Ser. No. 259,630

Int. Cl. G01k *17/02*; G01n *33/00*

U.S. Cl. 23—230 R 7 Claims



1. A thermal detector for studying thermal properties of mixing reactants comprising first and second reactant duct means for circulating a first and a second reactant, each reactant duct means having an inlet end, an outlet end and a heat exchange region therebetween; a mixture duct means for circulating the product of said reactants having an inlet end, an outlet end, and a heat exchange region therebetween, said mixture duct means also defining a reactants mixing region located between its inlet end and its heat exchange region; and the outlet ends of said reactant duct means merging into the inlet end of said mixture duct means; the three heat exchange regions of said reactant duct means and mixture duct means being closely coupled and defining a counter-current heat exchanger wherein said reactants circulate in the first direction through said reactants duct means while said product circulates in the opposite direction through said mixture duct means; thermal insulation means for insulating said reactant and mixture duct means from the environment, temperature sensing means for detecting the temperature of said product, and thermostating means for controlling the temperature of said reactants at the inlet ends of said first and second reactant duct means.

3,856,468

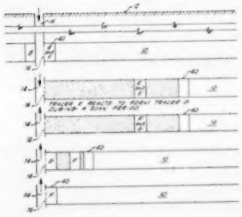
METHOD FOR DETERMINING FLUID SATURATIONS IN PETROLEUM RESERVOIRS

Theodore E. Keller, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Dec. 7, 1972, Ser. No. 312,814

Int. Cl. E21b *43/16*; G01n *33/24*

U.S. Cl. 23—230 EP 12 Claims



1. A method for measuring the relative saturation of immiscible fluids present in a subterranean formation penetrated by

a well in communication therewith and wherein at least one of said fluids is mobile, which comprises:

injecting a carrier fluid into said formation, said carrier fluid being miscible with one of said mobile fluids and immiscible with at least one of the other fluids and containing low concentrations of (1) a precursor that partitions between the carrier fluid and the immiscible fluid and that reacts in the formation to form a first tracer material that partitions between the carrier fluid and the immiscible fluid differently than the precursor and (2) a second substantially non-reactive tracer material that partitions between the carrier fluid and the immiscible fluid to about the same degree as said percursor;

displacing said carrier fluid into said formation;

shutting in said well for a time period sufficient to permit the precursor to react to form detectable quantities of said first tracer material;

producing said well to recover fluids from said formation;

analyzing said recovered fluids to determine the concentrations of said first and second tracer materials in said fluids as a function of the volume of said fluids produced from said formation; and

applying chromatographic principles to determine the relative saturation of the immiscible fluids present in said formation.

3,856,469
INTERFERANT REMOVAL FROM AMPHETAMINE IMMUNOASSAY

Richard S. Schneider, Sunnyvale, and Edwin F. Ullman, Atherton, both of Calif., assignors to Syva Corporation, Palo Alto, Calif.

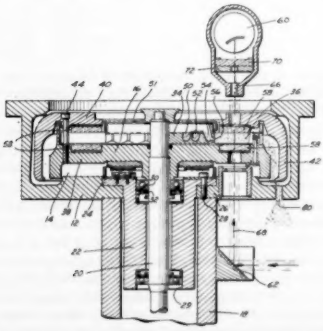
Filed Jan. 2, 1973, Ser. No. 320,374
Int. Cl. G01n *23/00, 31/02, 33/16*
U.S. Cl. 23—230 B **10 Claims**

1. In an assay method for determining aralkyl amines, wherein 1-aralkyl β-hydroxyamines interfere, the improvement which comprises: treating the sample to be assayed at a pH greater than about 8 with an amount of aqueous periodate solution sufficient to remove the hydroxyamine interferant wherein said pH is maintained by the presence of an ammonium hydroxide.

3,856,470
ROTOR APPARATUS

Herbert M. Cullis, Silver Spring; Willard E. Fordham, Laurel, and Charles I. Soodak, Silver Spring, all of Md., assignors to Baxter Laboratories, inc., Morton Grove, Ill.

Filed Jan. 10, 1973, Ser. No. 322,323
Int. Cl. F25b *21/02;* **B04b** *15/02;* **G01n** *1/10, 21/00*
U.S. Cl. 23—253 R **3 Claims**



1. In a photometric solution analyzer comprising a power-driven rotor assembly which defines a multiplicity of sample analysis chambers for accepting liquid samples to be analyzed, said rotor assembly having transparent walls adjacent said sample analysis chambers for permitting the passage of light therethrough and a multiplicity of chambers adapted to retain liquid samples and reactants when said rotor assembly is at rest, and to release said liquid samples and reactants to said sample analysis chambers when said rotor is rotated; and stationary photometric means for detecting changes in the analysis chambers by passing a beam of light through the transparent walls of said rotor assembly, the improvement comprising:

electric powered temperature adjusting means mounted on, and rotatable with, said photometric assembly;

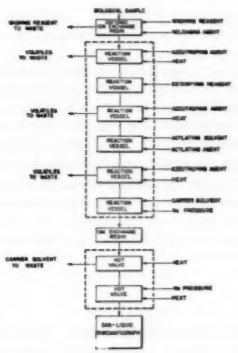
electric output producing temperature sensing means mounted on, and rotatable with, said photometric rotor assembly; and

means coupled to said temperature adjusting means and said temperature sensing means for controlling the temperature adjusting means to precisely maintain the temperature of said photometric rotor assembly at a selected value.

3,856,471
AMINO ACID ANALYSIS

Milton Winitz, Palo Alto, and Jack Graff, Santa Clara, both of Calif., assignors to The United States National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 5, 1968, Ser. No. 750,235
Int. Cl. B01d *15/08;* **G01n** *31/08, 33/16*
U.S. Cl. 23—253 R **2 Claims**



1. Apparatus for qualitatively and quantitatively determining the amino acid contents of a sample, which apparatus comprises:

a reaction vessel for holding a group of amino acids from a sample,

means for supplying to said vessel in serial order (a) an azeotroping agent, (b) an esterifying reagent, and (c) azeotroping agent to convert said amino acids to the N-acyl amino acid alkyl ester derivatives thereof,

means for heating said reaction vessel to remove solvents and water,

means for supplying to said vessel a carrier solvent for said entire N-acyl amino acid alkyl ester mixture,

heating chamber means to which said mixture is transferred from said reaction vessel,

means for connecting said chamber means to waste while said carrier solvent is vaporized,

means for thereafter connecting said chamber means to the inlet of a gas chromatographic device and to a source of

carrier gas for transferring said amino acid derivatives thereto in the gaseous state, and

a control device connected to each of said above-mentioned means for automatically effecting sequential timed operation of each of said above-mentioned means.

3,856,472
APPARATUS FOR THE GETTERING OF SEMICONDUCTORS

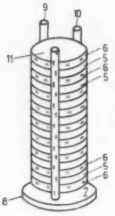
Samuel Schweitzer, Birr, and Georg Ziffermayer, Wittingen, both of Switzerland, assignors to Brown Boveri & Company Limited, Baden, Switzerland

Filed Dec. 19, 1972, Ser. No. 316,520

Claims priority, application Switzerland, Dec. 20, 1971, 18431/71

Int. Cl. H01k *9/00*; **H01j** *7/18*

U.S. Cl. 23—252 **3 Claims**



1. A semi-conductor gettering assembly comprising a stack of semi-conductor discs separated from each other by discs of the same size interposed respectively therebetween made from a getter material and which lie in contact with the faces of said semi-conductor discs, said getter material being selected from the group consisting of quartz glass, silicon nitride and boron nitride, and a structure made of the same material as said getter discs supporting said stacked discs comprising a base plate and at least three upstanding rods thereon distributed about a vertical axis which surround and engage the periphery of the discs.

3,856,473
APPARATUS FOR MEASURING NO_x CONCENTRATIONS

Glenn W. Dillon, Newton Centre, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Filed Feb. 26, 1974, Ser. No. 445,877

Int. Cl. G01n *21/26*; **H01j** *39/12*

U.S. Cl. 23—254 E **12 Claims**

1. Apparatus for analyzing a gaseous sample flow to measure the concentration of a constituent of the flow which reacts in a chemiluminescent manner with ozone, said apparatus comprising:

a sample chamber;

photodetector means for detecting light in said chamber and generating a signal which is responsive thereto;

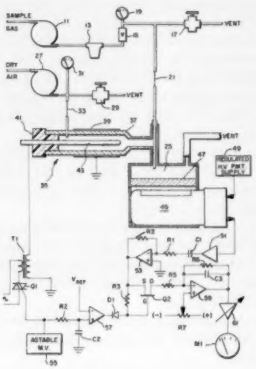
means for providing a continuous flow of the gaseous sample into the chamber;

means for providing a continuous flow of a reaction gas including oxygen;

means, including an electrically energizable ozonator, for coupling the flow of reaction gas to said chamber for reaction with the sample gas flow, said ozonator being operative, when energized, to convert at least a portion of the oxygen in said reaction gas flow to ozone;

means for periodically energizing said ozonator; and

means for measuring the component of the photodetector signal which varies periodically with the same frequency as the periodic energization of said ozonator, the measurement so obtained being indicative of the concentration of the reactive constituent in the gaseous sample.



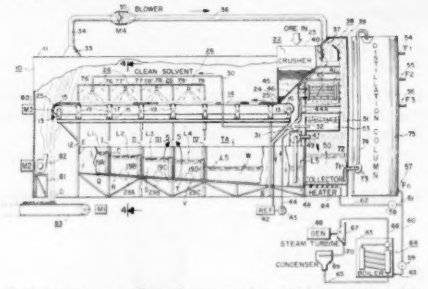
3,856,474
BITUMEN EXTRACTION APPARATUS INCLUDING ENDLESS PERFORATE CONVEYOR AND PLURAL SOLVENT-SPRAY MEANS

Tobe A. Pittman, 1517 Ninth St., Centerville, Utah 84014, and Jack L. Woods, 1409 Walker Bank Building, Ogden, Utah 84111

Filed Feb. 4, 1974, Ser. No. 439,442

Int. Cl. B01d *11/02*; **C10c** *3/08*

U.S. Cl. 23—267 R **3 Claims**



1. Apparatus to effect the extraction of bitumen from bitumen-containing crushed ore, including, in combination: a series of fixed, mutually horizontally spaced, solvent spray means for spraying crushed ore with bitumen solvent; movably revolvable endless conveyor means proximately disposed underneath said solvent-spray means, having a feed end and a discharge end, and including an endless perforate conveyor belt for transporting a layer of crushed ore operatively past said solvent-spray means, for producing, as a downfall therefrom, a bitumen-solvent solution; a series of fixed, mutually horizontally spaced, depending walls forming respective zones including said spray means, respectively, said walls depending toward but being proximately spaced with respect to said endless conveyor belt, whereby to permit a layer of ore, carried by said endless conveyor belt, to pass in proximately underneath said walls; means for containing said solution disposed underneath said conveyor belt; said endless conveyor belt including upper and lower, oppositely traveling courses,

said containing means being disposed beneath both courses and including transverse means defining contiguous, solution-collection chambers constructed for a maximum fluid level which is progressively lower as one progresses from said discharge end of said endless conveyor means to said feed end thereof; means disposed essentially above said containing means for receiving and condensing solvent vapors from said solution, to form a condensate; means coupled to said receiving means for routing such condensed solvent back to at least one of said solvent-spray means; enclosure means surrounding said spraying means and said endless conveyor means for preventing escape of solvent vapors, beneath said enclosure means including a spent-ore exit opening disposed beneath said discharge end of said endless conveyor belt, blower means constructed and positioned proximate said opening to force solvent vapors away from said opening and within said enclosure means; and said enclosure means including a blower provided exhaust vent means disposed above said discharge end of said endless conveyor belt for exhausting solvent fumes back to said receiving and condensing means.

3,856,475

AN APPARATUS FOR TRANSFERRING A GAS BETWEEN TWO LIQUIDS

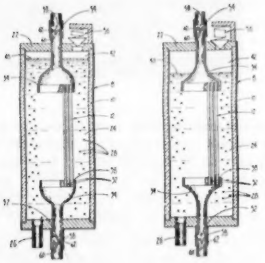
Guenter H. Marx, Engadiner Str. 4, Munich, Germany

Filed Dec. 10, 1970, Ser. No. 96,865

Claims priority, application Germany, Dec. 17, 1969, 1963319

Int. Cl. A61m *1/03*

U.S. Cl. 23—258.5 **22 Claims**



1. A heart-lung combination comprising: a housing containing a liquid which has a high solubility for oxygen and into which an oxygen containing gas is introduced, a plurality of relatively long, small diameter tubes constructed of a resilient, flexible, gas pervious material for the transfer of oxygen to blood flowing in the tubes, the tubes being disposed in the housing and in fluid communication through blood inlet and blood outlet means with the exterior of the housing for connection to a circulatory system, first valve means communicating the housing interior with the exterior, and check valve means disposed in the blood inlet and blood outlet means to control the flow of blood, means to provide pressurization of the liquid in the housing and means for selectively alternatingly opening and closing the first valve means whereby the tubes are alternatingly compressed and expanded and thereby alternatingly draw blood in a flow direction from the housing exterior into the tubes and force blood in the same direction of flow from the tubes to the housing exterior.

3,856,476

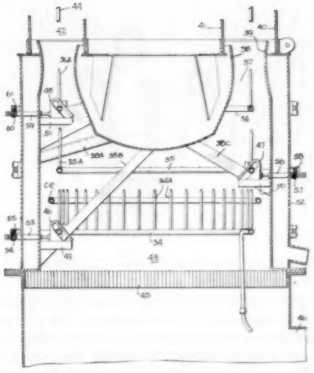
HIGH VELOCITY WET ELECTROSTATIC PRECIPITATION FOR REMOVING GASEOUS AND PARTICULATE CONTAMINANTS

Alexander P. De Seversky, New York, N.Y., assignor to Seversky Electronatom Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 723,810, April 24, 1968,. This application Jan. 31, 1972, Ser. No. 222,227

Int. Cl. B03c *3/01, 3/16, 3/78*

U.S. Cl. 23—284 **17 Claims**



1. An electrostatic wet precipitator adapted to purify a gaseous stream containing gaseous as well as particulate contaminants before the stream is discharged into the atmosphere, said precipitator comprising:

a. concentrically-arranged collector tubes defining at least one vertically-disposed annular gas passage having an inlet at the lower end of the tubes and an outlet at the upper end thereof, said outlet leading to the atmosphere,

b. means to produce downwardly-flowing films of liquid on the complementary surfaces of adjacent tubes which line said passage thereby to form liquid collectors,

c. a discharge-electrode structure disposed within said passage in spaced relation to said liquid collectors;

d. inlet means including a reaction chamber disposed below said collector tubes followed by a Venturi opening to feed said contaminated gaseous stream at a relatively high velocity into the inlet of each passage to produce an expanding gas which flows upwardly through said passage in counter-current relationship to said liquid films to force said films against said surfaces to maintain the uniformity thereof;

e. means to apply a high voltage between said discharge electrode structure and said liquid collectors to ionize the particulate contaminants in the gaseous stream flowing through said passage to cause migration of said particulate contaminants toward said liquid collectors and thereby purify the stream;

f. means in said reaction chamber to disperse reagents therein to react with said gaseous contaminant to produce reaction products in particulate form which are ionized and precipitated in said passage along with said particulate contaminants in said stream,

g. adjustable means to optimize the amount of reagents dispersed in said chamber relative to the existing concentration of the gaseous contaminant to an extent whereby substantially all of said gaseous contaminant is caused to react with said reagents and the stream discharged into the atmosphere through said outlet is substantially free both of said reagents or said gaseous contaminant, and

h. means separate from said reaction chamber to drain said liquid collectors and thereby recover said reaction products.

3,856,477

PROCESS FOR REFINING ZIRCONIUM TETRACHLORIDE CONTAINING HAFNIUM TETRACHLORIDE

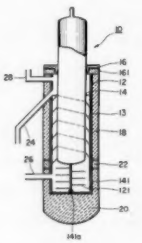
Hiroshi Ishizuka, 19-2 Ebara-6-chome, Tokyo, Japan

Filed Dec. 27, 1971, Ser. No. 212,170

Claims priority, application Japan, Dec. 28, 1970, 45-119693; Nov. 20, 1971, 46-92751; Dec. 6, 1971, 46-97835

Int. Cl. B01d *3/30, 7/00*

U.S. Cl. 23—294 4 Claims



1. A process for refining zirconium tetrachloride containing hafnium tetrachloride by collecting refined zirconium tetrachloride at the lower end of a thermal distillation column, while exhausting hafnium enriched zirconium tetrachloride from the upper end of the column, which process comprises the steps of maintaining one of two substantially vertical facing surfaces forming the distillation column at a uniform temperature higher than the sublimation temperature of zirconium tetrachloride while maintaining the other surface at a uniform temperature lower than the sublimation temperature; feeding vapor of crude zirconium tetrachloride to the distillation column in the space between the facing surfaces to condense zirconium tetrachloride at the lower temperature surface; scraping off the condensate from the lower temperature surface to cause at least a part of the condensate thus removed to contact the higher temperature surface for evaporation; causing a downward flow of the condensate while causing an upward flow of the vapor generated by said evaporation of said once deposited and scraped off condensate; repeating said condensation of the vapor due to contact with the lower temperature surface, scraping off the condensate and partial evaporation of the scraped condensate due to contact with the higher temperature surface; and causing sublimation of at least a part of the condensate collected at the lower end of the distillation column for further repeating said condensation and evaporation.

3,856,478

FE-MO-C-[CR] SINTERED ALLOYS FOR VALVE SEATS

Tokushige Iwata; Kiyoaki Sakamoto; Teruo Nawata; Hiroyasu Endo; Masaru Nakano, all of Kyoto, and Hajime Murayama, Niigata, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha and Mitsubishi Kinzoku Kogyko Kabushiki Kaisha, both of Tokyo, Japan

Filed Dec. 8, 1972, Ser. No. 313,340

Claims priority, application Japan, Dec. 22, 1971, 46-104303

Int. Cl. C22c *39/14, 39/50, 33/02*

U.S. Cl. 29—182 6 Claims

1. A ferrous sintered alloy valve seat having improved impact wear characteristics and having coated or having uniformly deposited on the engaging surfaces thereof stable, durable and self-lubricating protective oxide film securely bonded thereto, said surfaces and valve seat containing suitable voids therein adapted to retain said protective oxide film; said alloy consisting essentially of 0.4–2.0 weight percent carbon, 2–10 weight percent molybdenum in the form of ferromolybdenum particles dispersed in the microscopic metallurgical structure, balance iron;

said alloy having a hardness value (HVN) of between about 111 and about 282;

said valve seat present a durable hot impact wear-resistant surface in contact with the valve associated therewith without promoting substantial wearing of said valve under heated conditions.

3,856,479

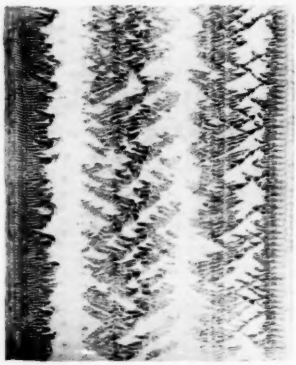
CONTINUOUSLY CAST PLATE WITH TEXTURED SURFACE

Clement Roger Howle, Murrysville, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 23,205, March 27, 1970, Pat. No. 3,697,393. This application Apr. 3, 1972, Ser. No. 240,873

Int. Cl. B22c *7/00*

U.S. Cl. 29—183 3 Claims



1. Improved continuously cast decorative plate not over 1 inch in thickness composed of an aluminum alloy consisting essentially of 3 to 13 percent silicon, balance essentially aluminum, characterized by a substantially uniform internal structure throughout except for a surface region including a textured surface having multiplicities of outer and inner faces and by different constituent distribution patterns in an aluminous matrix associated with said faces such as to provide a repeating occurrence of each respective pattern associated with the respective inner and outer faces such that the pattern in the region of the outer faces is fine and closely spaced whereas that in the region of the inner faces is coarse and widely spaced so as to produce, in response to integral color anodic coating treatments, different color-shade development such that said outer faces produce a darker color-shade effect and the inner faces produce a different and lighter effect, which effects occur repeatedly throughout said textured surface.

3,856,480

DIAMOND JOINED TO METAL

Donald R. Johnson, and James R. Sawers, Jr., both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

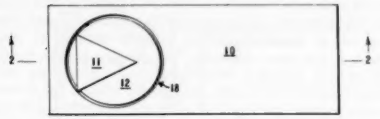
Filed Feb. 16, 1973, Ser. No. 333,144

Int. Cl. B32b *15/04*

U.S. Cl. 29—195 5 Claims

1. An article of manufacture comprising: a metal shank; an alloy selected from the group consisting of gold-tantalum alloys containing from about 1 to about 25 percent by weight of tantalum, and gold-niobium alloys containing from about 1

to about 10 percent by weight of niobium; an inert powdered material dispersed in at least a portion of said alloy; and a



diamond, adhered to said metal shank by said alloy at all opposed surfaces of said metal shank and said diamond.

3,856,481

METHOD OF MAKING PLASTIC COAL BRIQUETTS

Grigory Mikhailovich Grechanichenko, Pushkinsky viezd, 7, kv. 16; Evgeny Savelievich Gusinsky, ulitsa Lopanskaya, 34; Anatoly Semenovich Petrukhno, ploschad Rozy Ljuxemberg, 5, kv. 26, and Evgeny Vladimirovich Dobrovolsky, Pushkinsky viezd, 7, kv. 8, all of Kharkov, U.S.S.R.

Filed Nov. 21, 1973, Ser. No. 418,036

Int. Cl. C10l *5/00, 5/10*

U.S. Cl. 44—10 H **2 Claims**

1. A method of making plastic coal briquettes from gas coals and poorly caking coals, comprising the steps of: heating the coals to a softening temperature thereof; maintaining the heated coals under approximately isothermal conditions; pressure forming a plastic coal strip having a thickness which is not less than the required thickness of a plastic coal briquette to be made from the heated coals; pressure forming individual plastic coal briquettes from the pressure formed coal strip.

3,856,482

DEGASSING OF BRINE

Robert La Fortune, Mentor, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation of Ser. No. 172,239, Aug. 16, 1971, abandoned. This application Dec. 18, 1972, Ser. No. 316,407

Int. Cl. B01d *19/00, 39/04*

U.S. Cl. 55—36 **1 Claim**

1. The method of clarifying brine clouded by very finely divided and substantially uniformly dispersed incipient gas bubbles, which method comprises:

A. passing the clouded brine into a fibrous filter element disposed within a filter zone, said element having a fiber density sufficient to provide a pressure drop for said brine across said filter element of not substantially below about 20 p.s.i.g., and containing in the element natural fibers, synthetic fibers, or both maintained in said filter zone at least in part by resin binding, wherein said fibers are selected from the group consisting of natural wool, cellulose, and rayon, and said fibers are bound together by a synthetic, water-insoluble resin;

B. withdrawing flowing, clarified and gas-depleted brine from the downstream region of said filter zone, said clarified brine being at a pressure of not substantially less than about 20 p.s.i.g. below the pressure of said clouded brine entering said filter element; and,

C. permitting passage of gas from said filter zone and away from the resulting clarified brine flowing away from said filter zone.

3,856,483

METHOD AND DEVICE FOR DEGASSING LIQUIDS

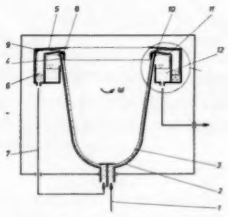
Hans Rumpf, Hansjakobstr. 12, 75 Karlsruhe; Kurt P. Leschonski, Claus Thal-Zellerfeld, and Helmar Schubert, Karlsruhe-Durlach, all of Germany, assignors to Hans Rumpf, Karlsruhe, Germany, by said Leschonski and said Schubert

Filed Sept. 21, 1972, Ser. No. 291,031

Claims priority, application Germany, Sept. 21, 1971, 2147124

Int. Cl. B01d *19/00*

U.S. Cl. 55—38 **11 Claims**



1. Method of degassing a liquid flowing in a film along the inner peripheral surface of a rotating centrifuge rotor, which comprises dividing the liquid, before it leaves the rotor, into a fraction having a low gas-bubble content and a fraction having a high gas-bubble content, separately removing the fraction having a high gas-bubble content, and separately removing the liquid fraction having the low gas-bubble content from the rotor in a manner to minimize the addition of further gas-bubbles thereto.

3,856,484

PROCESS FOR RECOVERING ETHYLENE OXIDE

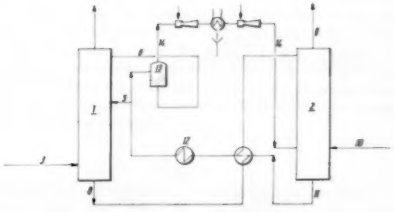
Giacchino Cocuzza, Catania, and Benedetto Calcagno, Milan, both of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Nov. 15, 1973, Ser. No. 416,136

Claims priority, application Italy, Nov. 30, 1972, 32275/72

Int. Cl. B01d *53/14*

U.S. Cl. 55—48 **7 Claims**

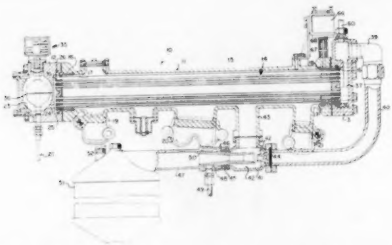


1. A process for recovering ethylene oxide from a gaseous mixture containing it in quantities up to 3 percent by weight, using an aqueous solvent to absorb the gaseous mixture in an absorption region, stripping the enriched solvent with steam in a stripping region and recycling the lean solvent from the stripping region to the absorption region, characterized in that the lean recycled solvent is supplied in two flows, a main flow and a secondary flow, to two separate places in the absorption region, the main flow being supplied at a temperature equal to, or less than, 40° C and the secondary flow being substantially free from ethylene oxide and supplied at a temperature at least 15° C lower than the temperature of the main flow, the weight ratio between the main flow and secondary flow being kept at values of from about 2:1 to 5:1.

3,856,485
APPARATUS AND METHODS FOR TREATING EXHAUST GASES OF COMBUSTION

Henry J. Mansell, Davison, Mich., assignor to Meps, Inc., Flint, Mich.

Continuation-in-part of Ser. No. 684,751, Nov. 11, 1967, abandoned. This application Nov. 24, 1969, Ser. No. 879,457
Int. Cl. B01d *53/14, 53/04;* F02b *13/10*
U.S. Cl. 55—73 26 Claims

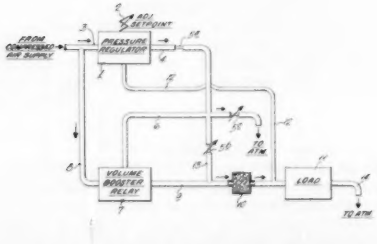


1. A method of reducing undesirable emissions caused by the combustion of hydrocarbon fuel, said method comprising introducing a mixture of fuel and air to a combustion chamber in a lean ratio such as to provide an excess of air sufficient to minimize the formation of carbon monoxide and to assure combustion of said fuel at a temperature in excess of about 1,450°F.; combusting said fuel in said chamber; exhausting the gases of combustion from said chamber; and quenching said gases to a temperature below about 1,450°F. substantially instantaneously upon their exhaust from said combustion chamber to inhibit the formation of oxides of nitrogen.

3,856,486
PNEUMATIC PRESSURE CONTROL SYSTEM

Robert C. C. Chang, Sao Paulo, Brazil, assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Jan. 24, 1974, Ser. No. 436,262
Int. Cl. G05d *16/00*
U.S. Cl. 55—210 7 Claims

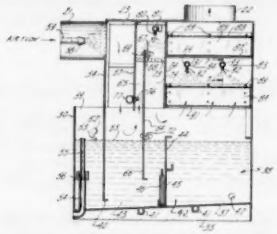


1. A pneumatic pressure control system for automatically controlling the pressure supplied to a load from an air supply, comprising a pressure regulator having a setpoint and arranged and connected to receive air from said air supply; a volume booster relay connected and receiving air from said air supply and supplying output air to a load, means connected to said regulator and relay for utilizing the output of said regulator to control the output pressure of said relay, and means connected adjacent said load to said regulator for feeding back a pressure signal from upstream said load to said regulator, for comparison with said setpoint to produce a signal.

3,856,487
GAS SCRUBBER

Manuel Perez, River Vale, N.J., assignor to Aerosols Control Corporation, Englewood, N.J.

Filed Aug. 11, 1972, Ser. No. 279,848
Int. Cl. B01d *47/06*
U.S. Cl. 55—223 8 Claims

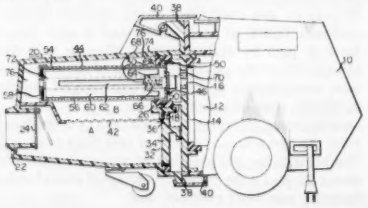


1. Gas scrubbing apparatus comprising
a housing having a gas inlet and a gas outlet;
baffle means in said housing forming a passageway therethrough connecting the gas inlet and the gas outlet, said baffle means comprising fixed baffle means connected to said housing and at least one movable baffle spaced from said fixed baffle which defines with said fixed baffle means an adjustable throat portion of reduced cross-sectional area in said passageway; means for adjusting said movable baffle;
spray means disposed in said throat portion in a plane substantially perpendicular to the direction of gas flow for producing a liquid spray across said throat portion transversing the direction of gas flow;
a liquid-filled sump portion in said housing; and
sump filter screen means dividing said sump portion into at lease a first sump section disposed beneath said gas inlet and said throat portion and a second sump section coupled to said spray means for supplying spray liquid thereto,
whereby gas passing through said throat portion from the gas inlet to the gas outlet is increased in velocity and turbulence and scrubbed by the liquid spray and said sump filter screen means is operable to prevent particulates and other contaminants falling into said first sump section from entering said second sump section, to thereby prevent clogging of said spray means.

3,856,488
ELECTRIC VACUUM CLEANER

Satoru Kato; Kouki Fukuda, and Kuninobu Nannichi, all of Ojima, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 4, 1973, Ser. No. 394,113
Claims priority, application Japan, Sept. 5, 1972, 47-102958; Sept. 5, 1972, 47-102960
Int. Cl. B01d *46/04*
U.S. Cl. 55—300 4 Claims



1. An electric cleaner device comprising, in combination, a housing including an exhaust port and an electrically operated

blower disposed therein, a dust collector casing detachably engaged by said housing, said dust collector casing including a dust suction port and an opening for dumping dust, a tubular filter unit having end faces secured to an opening in a partition of said dust collector casing so as to be inserted into and pulled out from the latter through the interface at which said dust collector casing engages said housing, said filter unit having a vent opening formed only on that end face thereof adjacent to said interface of said dust collector casing and said housing, an annular packing element secured to the outer periphery of said end face of said filter unit, and a pushing element on said housing capable of engaging said packing element in the assembled position, said filter unit being sealed in said dust collector casing by having said packing element abutting against said dust collector casing while said pushing element pushes against the packing element to maintain the hermetic seal between said packing element and said dust collector casing.

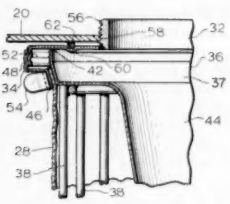
3,856,489

HOLDER FOR ANNULAR FILTER

Edward J. Vokral, Hinsdale, Ill., assignor to Evo Corporation, Hinsdale, Ill.

Filed June 22, 1973, Ser. No. 372,523
Int. Cl. B01d *46/02*
U.S. Cl. 55—379 **11 Claims**

8. A filter holder unit comprising:
an annular filter;



body means for supporting the annular filter, said body means having a first conical section for receiving the annular filter;
a sealing annulus having a second conical section for sealing the annular filter to the first conical section of said body means;
means for drawing the second conical section of said sealing annulus toward the first conical section of said body means in such manner as to clamp the annular filter between the first conical section of said body means and the second conical section of said sealing annulus and form a continuous seal around the annular filter; and wherein
the first conical section of said body means has a sealing lip for engaging said drawing means and forming a seal therewith.

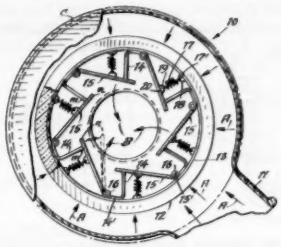
3,856,490

BAFFLE FILTERS FOR CARBURETORS

Leo Heintzelman, 4990 Burlingame S.W., Wyoming, Mich. 49509

Filed Aug. 27, 1973, Ser. No. 392,042
Int. Cl. B01d *50/00*
U.S. Cl. 55—420 **6 Claims**

1. In an air regulator for a carburetor, including, in combination, a band of a given height, forming an enclosure a plurality of holes extending through said band so that air may freely pass therethrough, means forming an air trap for air passing through at least some of said holes in said band to restrict the flow of air into the enclosure formed by said band, said air trap means including a plurality of baffle plates movably mounted within said band for movement between a closed position, blocking air movement through said air trap, and an open position, permitting air movement through said air trap, and means for biasing said baffle plates in a closed position so that



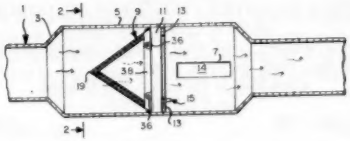
the baffle plates are opened by an increase in vacuum pressure in the carburetor and closed when the vacuum pressure within the carburetor drops.

3,856,491

AIR FILTER AND AIR FILTERING SYSTEM

Charles Dietrich, 1794 Los Gatos-Almaden Rd., San Jose, Calif. 95124

Filed June 7, 1973, Ser. No. 367,795
Int. Cl. B01d *46/16*
U.S. Cl. 55—478 **8 Claims**



1. An improved and foldable air filter, comprising:
1. an inflatable tube which when inflated defines a polygon having at least four sides;
2. an orifice communicating with the interior of said tube for inflating and deflating said tube; and
3. a plurality of triangular shaped filter elements in a number equal to the number of sides of said polygon, each triangular shaped filter element having the base thereof of the same length as a side of said polygon and said base including means for attaching said base to said side, the adjacent legs of adjacent of said triangular shaped filter elements being bendably attached to one another, by attachment material sufficiently flexible so that the filter can be folded said triangular shaped filter elements being of such a size that the apexes of said triangular shaped filter elements coincide.

3,856,492

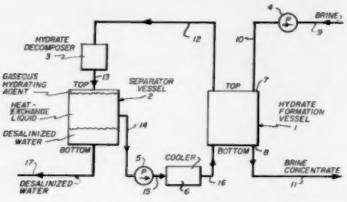
HYDRATE FORMING IN WATER DESALINATION

Donald L. Klass, Barrington, Ill., assignor to The Institute of Gas Technology, Chicago, Ill.

Continuation-in-part of Ser. No. 880,734, Nov. 28, 1969, abandoned. This application May 5, 1972, Ser. No. 250,791
Int. Cl. B01d *9/04*
U.S. Cl. 62—58 **14 Claims**

1. A process for water desalinization comprising the steps of: commingling in a hydrate formation zone at a temperature above ice formation, brine and a heat-exchange liquid which is substantially immiscible with brine and water, has a specific gravity different from the specific gravities of brine, water and the range therebetween and has a dissolved gaseous hydrating agent therein, said hydrating agent being capable of forming a solid hydrate having a specific gravity on the same side of the specific gravity of both water and brine as the specific gravity of said heat-exchange liquid and being substantially insoluble in said heat-exchange liquid; adjusting temperature, pressure

or a combination thereof to form a solid hydrate and a portion of the heat of hydration being absorbed by said heat-exchange liquid; withdrawing concentrated brine from said hydrate



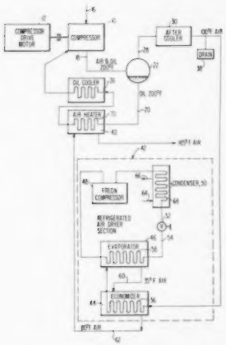
formation zone separate from said heat-exchange liquid and solid hydrate; withdrawing said heat-exchange liquid and said solid hydrate from said hydrate formation zone to a hydrate decomposition zone; decomposing said solid hydrate, aided by said heat of hydration being transferred directly from said heat-exchange liquid, in said decomposition zone directly into water and gaseous hydrating agent; separating said heat-exchange liquid containing gaseous hydrating agent dissolved therein and desalinized water; and all of the process being conducted at temperatures above ice formation.

3,856,493

ENERGY RECOVERY SYSTEM FOR OIL INJECTED SCREW COMPRESSORS

Clifford T. Bulkley, Glastonbury, Conn., assignor to Dunham-Bush, Inc., West Hartford, Conn.

Filed May 8, 1973, Ser. No. 358,445
Int. Cl. F25d 9/00
U.S. Cl. 62—401 **3 Claims**



1. In an air compressor system for delivering compressed air at relatively high temperature and moisture free to a load downstream of said compressor, and wherein said air compressor has a working chamber subjected to a lubricating and sealing oil with a large amount of the heat of compression of the air being absorbed by the oil in comparison with that retained by the air and wherein said system includes an oil separator which receives the compressor discharge and separates the oil from the compressed air for recirculation of the oil via nan oil return line to the compressor working chamber, and wherein a first heat exchanger is fluid coupled to the oil sump and receives the oil free compressor discharge air and cools the compressed air to effect condensation and includes a trap for removal of the moisture within the compressor discharge air prior to delivery of the moisture free compressed air to an end use device, the improvement comprising:

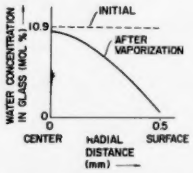
a second heat exchanger thermally coupling said oil within said return line between said oil separator and the air compressor working chamber to the oil free, moisture free compressed discharge air downstream of the first heat exchanger for returning the heat lost to the compressed discharge air at the first heat exchanger to the moisture free compressed air from the separated oil, thereby increasing the overall thermal efficiency of the system.

3,856,494

LIGHT-CONDUCTING GLASS STRUCTURES MADE BY VAPORIZATION

Ichiro Kitano, Kobe, and Yoshiro Ikeda, Nishinomiya, both of Japan, assignors to Nippon Selfoc Kabushiki Kaisha, also known as Nippon Selfoc Co. Ltd., Tokyo-to, Japan

Continuation-in-part of Ser. No. 865,201, Oct. 9, 1969, abandoned. This application June 5, 1972, Ser. No. 259,780
Claims priority, application Japan, Oct. 19, 1968, 43-76229; Dec. 12, 1968, 43-91375
Int. Cl. C03c 15/00; C03b
U.S. Cl. 65—2 **7 Claims**



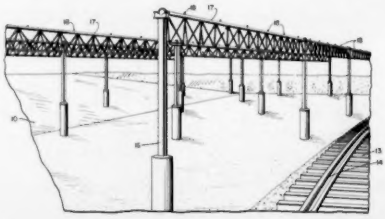
1. A method of producing a light-conducting glass structure having a center axis in the principal direction of light conduction and having a refractive index gradient which decreases continuously from the center axis toward the outer surface of said structure in any cross-section thereof perpendicular to the axis, which comprises: preparing a fiber glass body consisting essentially of a substantially homogeneous mixture of glass and water said water being dissolved in said body in a uniform concentration throughout and said body thereby having a uniform refractive index throughout and heating said glass body for a period of time sufficient to cause vaporization of said water from the surface of said glass body and to reduce the concentration of said water near the surface substantially more than the concentration of said water in the deeper regions of said glass body, whereby the concentration of said water in said glass body decreases continuously toward said surface from the center axis of the body, thereby due to the varying concentration of water the refractive index gradient continuously decreases in the body from said axis toward the surface.

3,856,495

METHOD OF PRODUCING LIGHTWEIGHT EXPANDED SLAG

Sidney Brian Foxton, Cockeysville, Md., assignor to The Arundel Corporation, Baltimore, Md.

Filed Sept. 26, 1973, Ser. No. 400,921
Int. Cl. C03b 19/00; C21b 3/06
U.S. Cl. 65—19 **3 Claims**



1. The method of forming a lightweight expanded slag in an open pit, comprising:

a. thoroughly wetting the pit bottom y an overhead umbrella spray system with water,

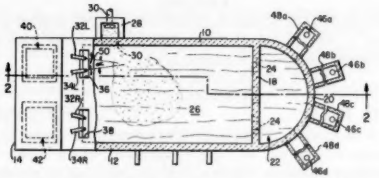
b. pouring the slag in a molten state rapidly into the pit so that by gravity flow the slag upon contacting the water is expanded,
c. wetting the slag while pouring with the umbrella spray,
d. scrubbing out during and after the pouring cycle the emissions from the expanding slag by means of said umbrella water sprays, and
e. building multiple layers of slag superposed one upon another thoroughly soaking and cooling each under layer prior to pouring a superposed layer.

3,856,496

GLASS MELTING FURNACE AND PROCESS

John D. Nesbitt, Chicago; Dennis H. Larson, Bridgeview, and Mark E. Fejer, Chicago, all of Ill., assignors to Leone International Sales Corporation, Bridgeton, N.J.

Filed Jan. 26, 1973, Ser. No. 326,593
Int. Cl. C03b *5/00, 5/24*
U.S. Cl. 65—29 **20 Claims**



1. The method of preparing and operating a glass melting furnace, said furnace including burners for admitting at least one pair of fuel jets into a melting zone of the furnace for mixture with air which is fed into the melting zone through air ports, comprising incrementally adjusting the directions in which said fuel jets are emitted with respect to the air flowing through said ports, measuring the amounts of excess air and carbon monoxide in the flue gases from the furnace after each incremental adjustment of said fuel jets, monitoring the quality of the glass pulled from the furnace, and continuing to adjust incrementally the directions of said fuel jets until said excess air has been minimized with the level of carbon monoxide being maintained below a preselected level while maintaining acceptable glass quality to thereby increase the mixing of fuel from the burners with air flowing through said air ports.

3,856,497

METHOD OF MAKING CRYSTALLIZED GLASS

Merritt J. Hummel, Lower Burrel, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 239,335, March 29, 1972, abandoned. This application Mar. 22, 1973, Ser. No. 343,981
Int. Cl. C03b *29/00*
U.S. Cl. 65—33 **5 Claims**

1. A method of making a crystallized glass article substantially free of microcracking, comprising:
a. preparing a glass batch consisting essentially of (1) a silica, (2) an alumina, (3) lithium family glass batch ingredient consisting of a lithium salt, and (4) a zinc salt in an amount sufficient to provide a crystallized glass article from said glass batch having a ZnO content, percent by weight on an oxide weight basis of 1 to 3.8, which crystallized glass article obtained upon cooling a melt of said glass batch, forming and heat treating said article is characterized by the presence of microcracks in the surface thereof;
b. adding to said glass batch an alkali metal salt wherein the alkali metal is a member of the group consisting of potassium, rubidium and cesium, said alkali metal salt being present in an amount sufficient to provide a glass article upon cooling a melt of said glass batch having a content of an oxide of the alkali metal of said salt, percent by weight on an oxide weight basis, of 0.15 to 2.50;
c. melting the glass batch containing the ingredients set forth in (a) and (b) to form a glass melt;
d. cooling said glass melt and subsequently therewith;
e. forming a glass article having the following composition on an oxide weight basis:

Component	Percent by Weight On An Oxide Basis
SiO_2	$64-_{74}$
Al_2O_3	$15-_{23}$
Li_2O	3.3–4.8
ZnO	1–3.8
TiO_2	$1.2-_{2.4}$
ZrO_2	$0-_{2}$
F	$0.15-_{0.40}$
R_2O, where R is Potassium rubidium or cesium	0.15–2.50,

and
f. heat treating said glass article at temperatures and for times sufficient to form crystals throughout the glass article and form a crystallized glass article having the surfaces thereof substantially free of microcracks.

3,856,498

GLASSWARE COATING APPARATUS AND PROCESS THEREFOR

Edward R. Campagna; Donald F. Hardy, both of Horseheads; Thomas W. Palmer, III; Barney R. Daugherty, both of Elmira Heights, and John R. Letawe, Horseheads, all of N.Y., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Mar. 7, 1972, Ser. No. 232,455
Int. Cl. C03c *17/32*
U.S. Cl. 65—60 **4 Claims**

1. A process for coating a glass container comprising:
preheating the container to a temperature of from about 400° F to about 600° F;
dipping the preheated container into a fluidized bed comprising a thermoplastic polymer having a particle size of from about 75 to about 20 mesh and a melt index of from about 1 to about 3 for from about 2 to 10 seconds;
heating said dipped container at a temperature of from about 400° F to about 550° for from about 2 to about 8 minutes to form a contiguous thermoplastic surface on said glass container; and,
cooling said coating and applying thereto a compound selected from the group consisting of wax, carnauba wax, silicone, and silicone-wax combinations.

3,856,499

SHAPING HEAT-SOFTENED GLASS SHEETS BY ROLL FORMING

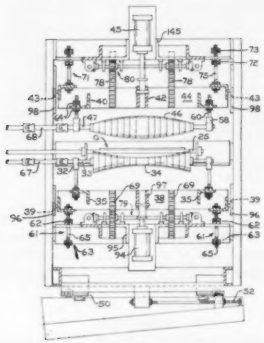
Robert G. Frank, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed June 20, 1973, Ser. No. 371,920
Int. Cl. C03b *23/02*
U.S. Cl. 65—104 **5 Claims**

1. A method of shaping deformable sheets by a roll forming method comprising
moving a flat sheet while said sheet is at its deformation temperature between a pair of opposed sets of rotatable shaping rolls having complementary shaping surfaces and disposed one set above the other set when the sets are separated sufficiently to provide clearance for the entry of said flat sheet between said sets, and when said flat sheet is moving between said sets,
providing relative movement between said sets toward one another until one of said sets of shaping rolls rotatably engages a portion of one surface of said sheet intermediate its opposite edges and the other of said sets of shaping

rolls rotatably engage a portion of the other surface of said sheet along its opposite edge portions, whereby said relatively moving sets apply a bending force tending to shape said sheet into conformity with said complementary shaping surfaces,

discontinuing said relative movement of said sets toward one another to discontinue the application of said bending force when said sets reach a position where they are separated by a predetermined distance slightly more than the thickness of said glass sheet,



continuing to move said sheet between said sets,

disengaging said sheet from the set disposed above the other set to support said sheet on said other set in rolling engagement therewith,

providing relative movement between said sets to separate said sets, and

removing said shaped sheet from between said sets before it cools below an elevated temperature sufficient to impart at least a partial temper by subsequent rapid cooling.

3,856,500
POTASSIUM POLYPHOSPHATE FERTILIZERS CONTAINING MICRONUTRIENTS

Donald E. Cox, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 811,569, March 28, 1969, abandoned. This application Dec. 29, 1972, Ser. No. 319,137

Int. Cl. C05b 7/00

U.S. Cl. 71—34 **11 Claims**

1. A liquid fertilizer composition having suspended or dispersed in its liquid phase as a micronutrient source finely-divided heavy metal potassium polyphosphate solid particles, at least one dimension of said particles being in the range of from about 1 millimicron to about 10,000 millimicrons, the heavy metal content of said composition being from 0.1 to 30 percent by weight and the heavy metal content of said polyphosphate being from 5 to 40 percent by weight.

3,856,501
AGENT FOR CONTROLLING THE GROWTH OF PLANTS

Bernd Zeeh, Ludwigshafen; Johann Jung, Limburgerhof, and Costin Rentzea, Heidelberg, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhein, Germany

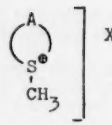
Filed Mar. 22, 1973, Ser. No. 343,627

Claims priority, application Germany, Apr. 13, 1972, 2217697

Int. Cl. A01n 9/14

U.S. Cl. 71—76 **10 Claims**

1. A process for stunting plant growth wherein the plants are treated with a plant growth stunting amount of a salt of the formula



where X^- denotes the anion of a non-phytotoxic acid and A denotes a chain which may be substituted by chlorine and has the structures

$-(CH_2)_3-$
$-(CH_2)_3-CHCl-CH_2-$
$-(CH_2)_2-CH=CH-CH_2-$
$-(CH_2)_2-S-(CH_2)_2-$
$-(CH_2)_2-SO-(CH_2)_2-$
$-(CH_2)_2-SO_2-(CH_2)_2-$
$-(CH_2)_n-S-CH_2-$

where *n* denotes one of the integers 2 and 3, or,

$-CH_2-S-CH_2-S-CH_2-$.

3,856,502
METHOD FOR STIMULATION OF PLANT GROWTH

Robert L. Noveroske, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 9, 1973, Ser. No. 386,928

Int. Cl. A01n 9/22

U.S. Cl. 71—77 **5 Claims**

1. A method for stimulating plant growth of plants in the presence or absence of fungal organisms which attack the foliar parts of plants which comprises applying to plants or plant parts a fungicidally effective and growth stimulating amount of a composition containing 2,3,5-trichloro-6-(methylsulfonyl)-4-cyanopyridine, as the active fungicide and growth stimulant, in intimate admixture with an inert carrier therefor.

3,856,503
HERBICIDAL METHOD AND COMPOSITIONS

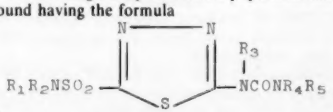
Tony Cebalo, Indianapolis, Ind., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 77,719, Oct. 2, 1970, Pat. No. 3,726,892, which is a continuation-in-part of Ser. No. 867,385, Oct. 17, 1969, abandoned. This application Jan. 22, 1973, Ser. No. 325,485

Int. Cl. A01n 9/12

U.S. Cl. 71—90 **10 Claims**

1. A method for the control of unwanted plants which comprises contacting such plants with a phytotoxic amount of a compound having the formula



wherein

R_1 is hydrogen or a substituted or unsubstituted lower alkyl radical, the substituents being selected from the class consisting of halo, hydroxy, cyano and lower alkoxy;

R_2 is hydrogen, a lower alkoxy radical, or a substituted or unsubstituted lower alkyl radical, the substituents being selected from the class consisting of halo, hydroxy, cyano and lower alkoxy, provided that R_1 and R_2 cannot both be hydrogen;

R_3 is hydrogen or a lower alkyl radical;

R_4 is hydrogen, a lower alkyl radical or a lower cycloalkyl radical; and

R_5 is hydrogen, a lower cycloalkyl radical, a lower alkoxy radical, or a substituted or unsubstituted lower alkyl radical, the substituents being selected from the class consisting of halo, hydroxy, cyano, or lower alkoxy, provided that R_4 and R_5 cannot both be hydrogen or a lower cycloalkyl radical;

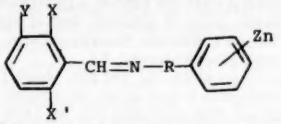
and tautomers thereof wherein R_3 is hydrogen.

3,856,504
USE OF CERTAIN N-(2,6-DIHALOBENZYLIDENE)-BENZYLAMINES AND CERTAIN N-(2,6-DIHALOBENZYLIDENE)PHENYLETHYLAMINES TO INCREASE CROP YIELD

Thomas K. Dickson, Greenville, Miss., assignor to Hercules Incorporated, Wilmington, Del.

Filed June 8, 1971, Ser. No. 151,151
Int. Cl. A01n 9/20
U.S. Cl. 71—121 **3 Claims**

1. A process for increasing the yield of a crop, which comprises applying to the growing plants of said crop an effective quantity of material selected from the group of compounds represented by the generic structural formula:



in which R is selected from the group consisting of CH_2, $CH(CH_3)$, $C(CH_3)_2$, and CH_2–CH_2, Z is selected from the group consisting of X'' and CH_3, n is selected from the group consisting of 0, 1 and 2, X, X' and X'' are selected from the group consisting of F, Cl, Br and I, and Y is selected from the group consisting of H and NO_2.

3,856,505
PROCESS FOR OBTAINING NICKEL CONCENTRATES FROM NICKEL OXIDE ORES

Tadaharu Ogawa, 10 of 2 Motohuto 4-chome, Urawa; Hiroshi Yasui, 22 of 26 Wada 2-chome, Tokyo, and Shigeo Kaji, 8 of 3 Ryoke 4-chome, Urawa, all of Japan

Continuation-in-part of Ser. No. 23,078, March 26, 1970, abandoned. This application June 15, 1972, Ser. No. 263,247
Claims priority, application Japan, Mar. 28, 1969, 44-23077
Int. Cl. C22g 1/08, 1/14
U.S. Cl. 75—3 **14 Claims**

1. A process for obtaining nickel concentrate from nickel oxide ore which comprises calcining a nickel oxide ore at a temperature which is at the minimum at least above 750°C., the temperature being sufficient to transform the mineral structure of the ore into that of forsterite or enstatite, pulverizing the calcined ore, mixing a carbonaceous reducing agent and a chloridizing agent with the pulverized ore, pelletizing the mixture, drying and then subjecting the pellets rapidly to a segregation reaction.

3,856,506
METHOD OF ROASTING FINE GRANULAR SULPHIDE MATERIAL IN FLUIDIZED BED FURNACES

Per Anders Herman Henningsson Fahlstrom, Boliden, and Karl Goran Gorling, Lidingo, both of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Continuation of Ser. No. 126,314, March 19, 1971, abandoned, which is a continuation of Ser. No. 739,222, June 24, 1968, abandoned. This application Oct. 26, 1973, Ser. No. 409,932
Int. Cl. C21b 1/20; C22b 1/10
U.S. Cl. 75—3 **7 Claims**

1. In a proces for roasting finely divided sulphide-containing flotation concentrates and other sulphide-containing products of similar extremely fine particle size in a furnace of the fluidized bed type wherein fluidizing gases are introduced in the lower portion of the bed and passed upwardly therethrough in effecting the roasting operation and finally depart the furnace via the furnace shaft together with the main part of the roasted product obtained during roasting, the improvement in the method of supplying the concentrates to said furnace which comprises

adjusting the water content of the concentrates not to exceed 30 per cent of their solid volume,

compacting said treated concentrates by passing them between substantially smooth surfaced rolls at a roll pressure less than 5 ton per cm roll length to obtain aggregates of suitable mechanical strength and size, and

directly charging the aggregates into the fluidized bed, the aggregates after being compacted having obtained such mechanical strength and size that when charged will penetrate into the bed to a sufficient depth to have time when decrepitating to be uniformly distributed over the area of said bed and become substantially roasted before particle entrainment by the roaster gases leaving the furnace.

3,856,507
RECOVERY OF GOLD FROM SOLUTION IN AQUA REGIA

James E. Brug, and Eric X. Heidelberg, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 12, 1973, Ser. No. 340,166
Int. Cl. C22b 11/04
U.S. Cl. 75—.5 A **10 Claims**

1. In the process for recovering gold from solution in aqua regia, the improvement comprising the steps of:

adding base to said aqua regia in an amount sufficient to raise the pH of the resulting reaction mixture to in the range to about 2 to about 4 without precipitating gold from solution while maintaining the temperature of said reaction mixture below about 50°C. and;

adding reducing agent to said reaction mixture in an amount sufficient to precipitate metallic gold from said reaction mixture; and

recovering said metallic gold from said reaction mixture.

3,856,508
METHOD FOR PRODUCING ALUMINUM CHLORIDE, ALUMINUM METAL, AND IRON DIRECTLY FROM ORES

Donald F. Othmer, 333 Jay St., Brooklyn, N.Y. 11201

Continuation-in-part of Ser. No. 103,765, Jan. 4, 1971, Pat. No. 3,793,003, and a continuation-in-part of Ser. No. 308,059, Nov. 20, 1972,. This application May 3, 1973, Ser. No. 356,905
Int. Cl. C21b 15/00; C22b 21/00
U.S. Cl. 75—29 **11 Claims**

1. A process under substantially atmospheric pressure for producing an aluminum halide from an original material in the form of pulverent solids containing aluminum and iron in compounds with oxygen comprising:

a. contacting said pulverent solids in a lower temperature reaction zone at a temperature of 500°C to 1050°C in the presence of a solid reductant with a gaseous halogenating agent containing a substantial amount of an aluminum halide; whereby an iron halide goes off in a gas stream; and a soild residue is formed substantially depleted of iron but containing at least most of the aluminum, much of which is in the same compounds present in said original material;

b. passing at least most of said iron halide in said gas stream to a higher temperature reaction zone which is charged with said solid residue substantially depleted of iron where, at a temperature between 1050°C and 2000°C in the presence of said solid reductant, said iron halide reacts with at least a part of said aluminum in said compounds contained in said residue from said first reaction zone, to form metallic iron and a gas stream containing an aluminum halide;

c. passing at least a part of said gas stream from said higher temperature reaction zone containing an aluminum halide as a halogenaing agent to said lower temperature reaction zone of (a) where it is contacted with said original pulverent soilds in the presence of said solid reductant

to produce said gaseous iron halide and said residue depleted of iron; and

d. removing said metallic iron from said higher temperature reaction zone.

3,856,509

PROCESS FOR THE REDUCTION OF IRON ORES OR THE LIKE IN THE PRODUCTION OF PIG IRON IN THE BLAST FURNACE

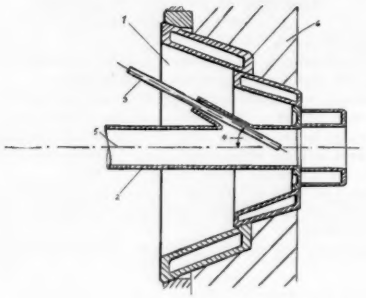
Gerhard Heynert, Mulheim, and Karl-Heinz Peters, Duisburg-Hamborn, both of Germany, assignors to August Thyssen-Hutte Aktiengesellschaft, Duisburg-Hamborn, Germany

Filed Apr. 27, 1972, Ser. No. 248,137

Claims priority, application Germany, Apr. 30, 1971, 2121241

Int. Cl. C21b *5/00*

U.S. Cl. 75—42 **14 Claims**



1. In a process for the reduction of an iron ore, sinter or other such starting material in a blast furnace in which at least a portion of the reducing agent comprises an oil, the improvement comprising introducing said oil into the blast furnace in the form of a water-in-oil emulsion having a water content between 3 and 15 percent by volume, said emusion being introduced in the tuyeres of the blast furnace, the amount of oil charged into the blast furnace being at least 90 kg of oil per metric ton of pig iron in the blast furnace.

3,856,510

PIG IRON REFINING PROCESS

Paul Emile Nilles, Embourg, Belgium, assignor to Eisenwerke-Gesellschaft Maximilianshutte m.b.H., Sulzbach-Rosenberg, Germany

Filed Apr. 3, 1973, Ser. No. 347,521

Claims priority, application Belgium, Apr. 4, 1972, 782186

Int. Cl. C21c *5/34*

U.S. Cl. 75—60 **7 Claims**

1. A pig iron refining process in a tipping converter of which the side wall is provided with at least one tuyere consisting of two coaxial conduits, the central conduit being for the blowing in of a highly oxidizing gas and the peripheral conduit being for the introduction of a protective fluid through the converter wall into the melt in said converter, which comprises:

1. loading the converter with liquid iron and with scrap iron,

2. putting the converter in an essentially vertical position,

3. blowing in a highly oxidizing gas through the central conduit of the side tuyere(s) simultaneously with the blowing in of a protective fluid through the peripheral conduit of said side tuyere(s) said tuyere discharging said oxygen and said protective fluid below the upper level of the metal bath,

4. continuing the blowing until a carbon content which is approximately the desired one has been achieved, and

5. thereafter placing the converter in an essentially horizontal position so that the outlet of the side tuyere(s) is located above the metal bath level, and thereafter completing the refining by blowing in a highly oxidizing gas which penetrates the slag and the metal through the slag through the central conduit of the side tuyere(s) simultaneously with the introduction of a protective fluid into said melt through the peripheral conduit of said side tuyere(s).

3,856,511

PURIFICATION OF CRUDE ALUMINUM

Warren E. Becker; James D. Johnston, both of Baton Rouge, La., and Clarence L. Hildreth, Brookhaven, Miss., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 234,401, March 13, 1972, , which is a continuation-in-part of Ser. No. 878,951, Nov. 21, 1969, abandoned. This application Feb. 20, 1974, Ser. No. 444,104

Int. Cl. C22b *21/04*

U.S. Cl. 75—68 B **10 Claims**

1. A process for refining an impure aluminum-containing source material, comprising:

a. heating the impure aluminum-containing source material with sodium fluoride in a first reaction zone to a temperature high enough to initiate reaction but below 1,000°C and effecting the reaction at a reduced pressure of less than about 100 millimeters of mercury, thereby avoiding the formation of aluminum mono fluoride and producing cryolite, residue, and metallic sodium, and causing said metallic sodium to be vaporized out of said reaction zone and separately condensed from said cryolite; and

b. reacting the cryolite produced in step (a) with metallic sodium in a second reaction zone at elevated temperature and at a pressure at least as high as normal atmospheric to keep the sodium from boiling out, thereby producing purified metallic aluminum and sodium fluoride.

3,856,512

PROCESSING TITANIFEROUS IRON ORES FOR THE RECOVERY OF ALUMINUM, CHROMIUM, IRON, TITANIUM AND VANADIUM

Joseph Palmer, Les Saules, Quebec, and Guy Handfield, Loretteville, Quebec, both of Canada, assignors to Centre de Recherche Industrielle du Quebec, Canada

Filed Apr. 27, 1973, Ser. No. 355,303

Int. Cl. C22b *3/00*

U.S. Cl. 75—101 R **12 Claims**

1. A process for treating titaniferous iron ore or concentrate having a total iron content of at least 40% and a titanium dioxide content of less than 25% which comprises

a. roasting the finely divided titaniferous iron ore or concentrate in an oxidizing atmosphere and in the presence of a roasting agent made up of a mixture of (1) a sodium oxide forming compound and (2) an alkaline earth metal oxide compound selected from calcium oxide, magnesium oxide, a calcium oxide forming compound, a magnesium oxide forming compound and mixtures thereof, the amount of sodium oxide or sodium oxide forming compound being at least the stoichiometric amount expressed as sodium oxide and calculated in accordance with the formula:

Na_2O(moles)

$= 2 \times Cr_2O_3$(moles) $+ 3 \times V_2O_5$(moles) $+ Al_2O_3$(moles)

and the amount of the second oxide forming compound of the roasting agent being at least the stoichiometric amount expressed as calcium oxide or magnesium oxide calculated in accordance with the formula:

CaO or MgO(moles)

$= 2 \times SiO_2(\text{moles}) + TiO_2(\text{moles}) - (CaO + MgO)$
(moles in the ore or concentrate)

b. leaching the roast with an aqueous solution of 5 to 75 gr/l of sodium carbonate and 2 to 10 gr/l of sodium hydroxide;

c. and separating the solid containing the residue from the chromate, aluminate and vanadate containing solution.

3,856,513
NOVEL AMORPHOUS METALS AND AMORPHOUS METAL ARTICLES

Ho-Sou Chen, Warren, and Donald E. Polk, Morristown, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

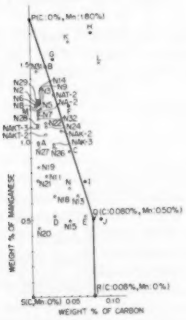
Filed Dec. 26, 1972, Ser. No. 318,146
Int. Cl. C22c *1/00, 19/00, 31/00, 37/00, 39/00*
U.S. Cl. 75—122 **8 Claims**

1. A metal alloy of the formula $M_aY_bZ_c$ which is at least 50 percent amorphous and wherein M is a metal selected from the group consisting essentially of iron, nickel, chromium, cobalt, or vanadium or a mixture thereof, Y is a metalloid selected from the group consisting of phosphorus, carbon and boron or a mixture thereof, and Z is an element selected from the group consisting of aluminum, silicon, tin, antimony, germanium, indium, and beryllium and mixtures thereof, "*a*", "*b*" and "*c*" are atomic percentages ranging from about 60 to 90, 10 to 30 and 0.1 to 15 respectively with the proviso that a plus *b* plus *c* equals 100.

3,856,514
COLD WORKABLE AND AGE-HARDENABLE STEEL

Chiaki Asada, Nagoya, and Toshiyuki Watanabe, Nishio, both of Japan, assignors to Daido Seiko Kabushiki Kaisha, Minami-ku Nagoya Aichi Prefecture, Japan

Filed Oct. 8, 1971, Ser. No. 187,825
Claims priority, application Japan, Oct. 19, 1970, 45-91150; Sept. 8, 1971, 46-68868
Int. Cl. C22c *57/14*
U.S. Cl. 75—124 **1 Claim**



1. A cold workable and age-hardenable steel, characterized in that it consists essentially of the weight percentages of carbon and manganese within the area enclosed by the line connecting points P, Q and R to the point S as shown in the accompanying FIG. 1; an effective amount up to 0.6 weight % of silicon, and, as age-hardenability improving alloying metals, more than 2.5 weight % of nickel, more than 0.6 weight % of aluminum, more than 0.5 weight % of copper and more than 0.5 weight % of titanium, the total amount of nickel, aluminum, copper and titanium being in the range of from 4.6 to 6.5 weight %, said point P indicating zero weight % of carbon and 1.8 weight % of manganese, said point Q indicating 0.08 weight % of carbon and 0.5 weight % of manganese, said point R indicating 0.08 weight % of carbon and zero weight % of manganese and said point S indicating zero weight % of carbon and zero weight % of manganese, and further consisting of, as alloying metals for improving the fineness of the crystalline particles of said steel, at least one element selected from the group consisting of an effective amount up to 0.3 weight % of the total amount of niobium and tantalum, an effective amount up to 0.5 weight % of vanadium and an effective amount up to 0.5 weight % of zirconium.

3,856,515
FERRITIC STAINLESS STEEL

Helmut Brandis; Rudolf Oppenheim, both of Krefeld, Gustav Lennartz; Sonnehause and Heinrich Kiesheyer, Krefeld, all of Germany, assignors to Deutsche Edelstahlwerke Gmbh, Krefeld, Germany

Filed Oct. 26, 1972, Ser. No. 301,067
Claims priority, application Germany, Oct. 26, 1971, 2153186; Oct. 28, 1971, 2153766
Int. Cl. C22c *39/20, 39/50, 39/54*
U.S. Cl. 75—126 C **1 Claim**

1. A ferritic high-chromium stainless steel operating while stressed at temperatures ranging between −100°C and 100°C and higher while in contact with fluids containing chlorides and consisting by weight of:

18 to 35%	chromium
.5 to 6%	molybdenum
0.001 to 0.01%	boron
0 to 5%	nickel
0 to 2%	copper
0 to 3%	silicon
0 to 1%	manganese
0 to 0.015%	carbon
0 to 0.015%	nitrogen

Remainder iron and impurities occasioned by smelting conditions.

3,856,516
LOW CREEP HIGH STRENGTH FERROUS ALLOY

Ray H. English, McCandless Township, Allegheny County, Pa., assignor to Blair-Knox Company, Pittsburgh, Pa.

Filed Feb. 12, 1970, Ser. No. 11,001
Int. Cl. C22c *39/20*
U.S. Cl. 75—128 W **3 Claims**

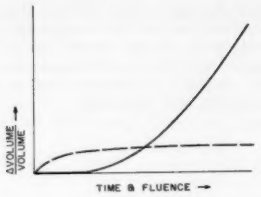
1. A low creep, high strength alloy resistant to corrosion and thermal shock at elevated temperatures and having unusual stress rupture characteristics at elevated temperatures consisting essentially of about **0.3%** to **0.9%** carbon, about **20%** to 30% chromium, about **15%** to **35%** nickel, about **0.8%** to **4%** manganese, about **0.9%** to **3.5%** silicon, about **0.3%** to **5%** tungsten, about **0.030%** to about **0.15%** sulfur and the balance iron with residual impurities in ordinary amounts.

3,856,517
IRRADIATION SWELLING RESISTANT ALLOY FOR USE IN FAST NEUTRON REACTORS

John F. Bates; James J. Holmes, both of Richland; Michael M. Paxton, Pasco, and Jerry L. Straalsund, Richland, all of Wash., assignors to The United States of America as represented by the U.S. Atomic Energy Commission, Washington, D.C.

Filed Nov. 26, 1973, Ser. No. 419,017
Int. Cl. C22c *39/14*
U.S. Cl. 75—128 A **2 Claims**

1. A stainless steel alloy resistant to void formation under irradiation by fast neutrons consisting essentially of the following:



Element	Weight Percent
Chromium	16.0 to 18.0
Nickel	11.0 to 14.0
Molybdenum	2.0 to 4.0
Silicon	1.1 to 2.0
Manganese	1.00 to 2.00
Carbon	0.04 to 0.08
Nitrogen	0.04 to 0.06
Phosphorus	0.00 to 0.03
Sulfur	0.00 to 0.03
Cobalt	0.00 to 0.05
Copper	0.00 to 0.01
Boron	0.00 to 0.001
Iron	Balance

3,856,518
METHOD OF ELECTROPHOTOGRAPHICALLY MANUFACTURING A TELEVISION SCREEN USING HYGROSCOPIC MATERIAL

Francis Bernardus Strik, and Nicolaas Augustinus Joseph Van Soerland, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 26, 1973, Ser. No. 335,942
Claims priority, application Netherlands, Mar. 4, 1972, 7202907
Int. Cl. G03g *13/22*; C03c *3/28*
U.S. Cl. 96—1 R **1 Claim**

1. A method of electrophotographically manufacturing a display screen of a color television display tube comprising a shadow mask and a face panel, said method comprising the steps of:

a. providing said face panel comprising a fireable conductive layer disposed thereon and a fireable photoconductive layer disposed on said conductive layer;

b. providing first phosphor particles comprising an outer layer of a hygroscopic material which is electrically conductive in a moist condition;

c. providing a first pattern of phosphor regions at said face panel by uniformly electrostatically charging said photoconductive layer and selectively discharging said photoconductive layer by exposing said photoconductive layer through a shadow mask, thereby forming a latent charge image which comprises charges in the regions corresponding to the said first pattern and then depositing on the said charge image and from an insulating developing liquid, first phosphor particles charged with opposite polarity to said latent charge image;

d. rendering said hygroscopic material of said first phosphor particles in a moist condition;

e. then repeating step (c) above with second phosphor particles to provide second phosphor regions at said face panel;

f. rendering said hygroscopic material on said face panel in a dry condition;

g. following step (f) providing a light-absorbing layer between said phosphor regions by uniformly electrostatically charging said photoconductive layer with said phosphor regions, selectively discharging regions of said photoconductive layer and said deposited phosphor regions by uniformly exposing said photoconductive layer with the said phosphor regions, and depositing between the charged phosphor regions and from an insulating developing liquid, light-absorbing particles charged with the same polarity as said photoconductive layer; and

h. firing the face panel to remove said conductive layer and said photoconductive layer.

3,856,519
TRANSFER OF TOWER USING A VOLATILE INSULATING LIQUID

Satoru Honjo, Tokyo, and Masamichi Sato, Asaka, both of Japan, assignors to Xerox Corporation, Stamford, Conn.

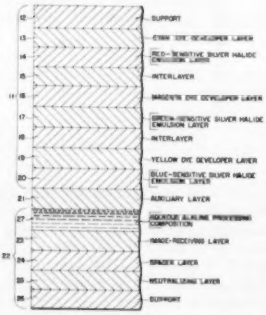
Filed Jan. 29, 1971, Ser. No. 111,126
Claims priority, application Japan, June 4, 1970, 45-48234
Int. Cl. G03q *13/10, 13/16*
U.S. Cl. 96—1.4 **6 Claims**

1. An imaging method comprising the steps of forming an electrostatic charge pattern on an electrostatographic imaging surface, developing the electrostatic latent image with a liquid developer comprising a high boiling point insulating liquid having electroscopic marking particles dispersed therein, contacting said imaging surface with said liquid developer thereon with a transfer sheet having substantially uniformly available at the contacting surface a volatile insulating liquid having a lower boiling point and a greater evaporation rate than said high boiling point liquid, and having an evaporation rate greater than about two times that of n-butyl acetate, transferring said particles from said imaging surface to said transfer sheet while said transfer sheet and said imaging surface are in contact, and drying said transfer sheet.

3,856,520
COLOR DIFFUSION TRANSFER PHOTOGRAPHIC ELEMENTS COMPRISING A SULFUR-SUBSTITUTED TETRAHYDROPYRIMIDINE DEVELOPMENT INHIBITOR PRECURSOR AND PROCESS FOR THEIR USE

Stanley M. Bloom, Waban, and Milton Green, Newton Centre, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 210,650, Dec. 22, 1971, abandoned, which is a continuation-in-part of Ser. No. 60,272, Aug. 3, 1970, abandoned. This application Apr. 9, 1973, Ser. No. 349,063
Int. Cl. G03c *7/00, 5/54, 5/30, 1/48, 1/40, 1/06*
U.S. Cl. 96—3 **19 Claims**



1. In a process for forming diffusion transfer images in color which comprises the steps of developing an exposed photosensitive element comprising a plurality of layers including a silver halide layer, at least one of said layers containing a dye image-providing material, by contacting said element with an aqueous alkaline solution, forming thereby an imagewise distribution of mobile dye image-providing material as a func-

tion of the point-to-point degree of exposure of said element, transferring by imbibition at least a portion of said imagewise distribution of mobile dye image-providing material to a superposed image-receiving element which comprises a dyeable polymeric layer, to provide to said dyeable polymeric layer a dye image; the improvement which comprises carrying out said process in the presence of a compound of the formula:

$$[Y-S--X$$

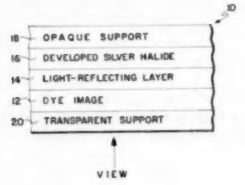
wherein Y is a tetrahydropyrimidine group and X is selected from the group consisting of hydrogen and a group hydrolyzable in said alkaline solution, said X being bonded to said compound through the sulfur or a ring nitrogen.

3,856,521

DIFFUSION TRANSFER COLOR FILM AND PROCESS

Ruth C. Bilofsky, Arlington, and Howard G. Rogers, Weston, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 24, 1972, Ser. No. 247,022
Int. Cl. G03c *7/00, 5/54, 1/40, 1/48, 1/84*
U.S. Cl. 96—3 **32 Claims**



1. A photographic product for forming a diffusion transfer image in dye within a permanent laminate including at least one developed silver halide layer, said photographic product comprising, in combination, an image-receiving layer; at least one silver halide emulsion, each said silver halide emulsion having associated therewith an image dye-providing substance selected from the group consisting of image dyes and image dye intermediates; means providing a light-reflecting layer containing a metal pigment between said image-receiving layer and said silver halide emulsion(s) to mask said silver halide emulsion(s) after development thereof and to provide a white background for viewing a dye image in said image-receiving layer; a transparent support through which image-receiving layer may be viewed; means providing a processing composition for developing said silver halide emulsion(s) after photo-exposure and for forming a transfer image in at least one dye in said image-receiving layer; said product including a silver halide solvent and a second silver halide complexing agent, said second silver halide complexing agent being capable of forming a relatively insoluble complex with silver halide; said product further including a compound which will form a colored product with ions of said metal at an acidic pH and said processing composition containing a metal complexing agent in a concentration effective to at least substantially prevent the formation of said colored product, said metal complexing agent being N-(carboxymethyl)-N'-2-hydroxyethyl-N,N'-ethylene glycine.

3,856,522

SPACER LAYER FOR DYE DIFFUSION TRANSFER FILM

Louis J. George, Somerville, and Ronald A. Sahatjian, Bedford, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 26, 1972, Ser. No. 318,402
Int. Cl. G03c *7/00, 5/54, 1/40*
U.S. Cl. 96—3 **18 Claims**

1. In a photographic product comprising a photosensitive element including at least one light-sensitive silver halide layer having a dye image-providing material associated therewith and an image receiving element including a dyeable stratum adapted for receiving a dye image pattern and a neutralizing system integrated with said photosensitive system or said image receiving element for lowering the pH of an aqueous alkaline processing composition; said neutralizing system including a neutralizing layer and a spacer layer arranged on a support and wherein said spacer layer is disposed with respect to said neutralizing layer so that said processing fluid must first diffuse through the spacer layer before contacting the neutralizing layer;

the improvement wherein said spacer layer comprises as a continuous phase a coalesced aqueous film-forming synthetic polymer dispersion which is substantially impervious to said processing fluid and a discontinuous phase comprising polyvinyl alcohol.

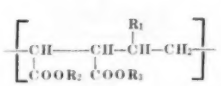
3,856,523

PROCESS FOR PREPARING LITHOGRAPHIC PLATES

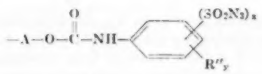
Henri Ulrich, Northford; Fred A. Stuber, North Haven, and Allen J. Broggi, Branford, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 315,303, Dec. 15, 1972, Pat. No. 3,792,025. This application Nov. 12, 1973, Ser. No. 414,731
Int. Cl. G03c *1/70, 5/16*
U.S. Cl. 96—33 **4 Claims**

1. A process for the preparation of a hydrophobic printing master which is receptive of oleophilic inks which comprises a. applying to a substrate a layer of a hydrophobic radiation-sensitive polymer characterized by a recurring unit of the formula:



wherein R_1 is selected from the class consisting of phenyl and lower-alkoxy and wherein one of R_2 and R_3 represents hydrogen and the other of R_2 and R_3 represents a group having the formula:



wherein A is straight chain alkylene having from 12 to 20 carbon atoms, inclusive, R'' is selected from the class consisting of lower-alkyl and halogen, x is an integer from 1 to 2, y is an integer from 0 to 2, provided that $x + y$ is not greater than 3, and the SO_2N_3 group is in any of positions 3,4 and 5 in the phenyl nucleus to which it is attached, and at least one of the said positions 3, 4 and 5 is unsubstituted;

b. exposing the coated substrate to appropriate radiation, transmitted via a negative of the image to be reproduced, to activate said radiation-sensitive polymer; and

c. developing the image produced by irradiation by dissolving away the unexposed radiation-sensitive polymer.

3,856,524

PHOTOGRAPHIC ELEMENTS AND PROCESSES FOR PROVIDING TANNED IMAGE RECORDS

Vernon Leon Bissonette, Brockport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 189,289, Oct. 14, 1971, abandoned, and a continuation-in-part of Ser. No. 189,331, Oct. 14, 1971, Pat. No. 3,748,138. This application Dec. 4, 1972, Ser. No. 312,157

Int. Cl. G03c 5/00, 5/24, 1/58, 5/22, 5/34, 5/26, 1/06, 1/48, 1/30; G03f 7/02

U.S. Cl. 96—35 26 Claims

1. A process of imagewise tanning a photographic element comprising at least one layer containing an unhardened hydrophilic colloid and at least one layer containing an imagewise distribution of a catalytic metal, said process comprising effecting contact of said imagewise distribution of metal with a liquid composition containing a cobalt (III) ion complex at a pH of at least 11, whereby said unhardened hydrophilic colloid is imagewise tanned.

3,856,525

METHOD FOR MANUFACTURING CATHODE RAY TUBE SCREEN

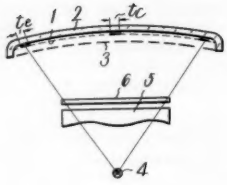
Takuji Inoue, Fujisawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sept. 15, 1972, Ser. No. 289,445

Claims priority, application Japan, Sept. 21, 1971, 46-73565

Int. Cl. G03c 5/00

U.S. Cl. 96—36.1 11 Claims



1. A method for producing the phosphor screen of a cathode ray tube comprising the steps of coating the surface of a face plate with a light sensitive layer containing phopshor material, exposing said layer to light passing through apertures of a mask from a light source which, in the course of said exposing of said layer to the light therefrom, is disposed at least at two positions relative to said face plate, which two positions lie on, and are spaced from each other along a line parallel to a line perpendicular to said face plate at the center of the latter so that the areas of said layer exposed to light from said source through apertures of said mask adjacent the periphery of the latter will be larger relative to the respective apertures than are the areas of said layer exposed to light from said source through apertures of said mask adjacent said center of the latter, and developing said light sensitive layer so that said phosphor material will remain only on selected areas of said surface corresponding to said areas of said layer exposed to light through said apertures.

3,856,526

PROTECTIVE LAYER FOR PHOTOTHERMOGRAPHIC ELEMENTS

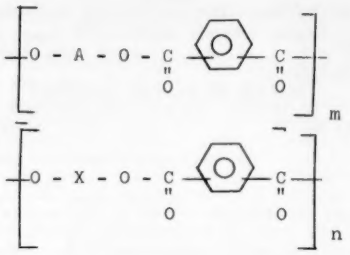
Fredrick L. Hamb, Rochester; Gary L. Hiller, Hilton, and Albert W. Wise, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 6, 1973, Ser. No. 385,934

Int. Cl. G03c 5/24

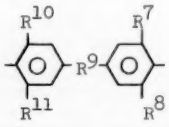
U.S. Cl. 96—48 HD 8 Claims

1. In a photothermographic element having a protective layer, the improvement comprising as said protective layer a carboxylic polyester having a glass transition temperature of at least 190°C. represented by the formula:



wherein A is a radical selected from the group consisting of

a. a radical represented by the formula:

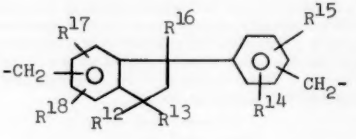


wherein

i. R^7, R^8, R^{10} and R^{11} are the same or different and each are hydrogen, halogen or alkyl containing 1 to 4 carbon atoms,

ii. R^9 is a bivalent polycyclic radical selected from the group consisting of 2-norbornylidene, hexahydro-4,7-methanoindane-5-ylidene, decahydro-1,4:5,8-dimethanonaphth-2-ylmethylene, octahydro-4,7-methanoisobenzofuran-6-ylidene, bicyclo [3.2.1] oct-2-ylidene, and tricyclo [2.2.1.$0^{2,6}$] heptan-3-ylidene; each of said bivalent polycyclic radicals having bonded to at least one of the polycyclic rings at least one radical selected from the group consisting of hydrogen, halogen, phenyl and alkyl containing 1 to 4 carbon atoms;

b. a radical represented by the formula:



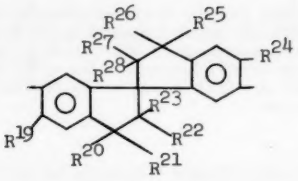
wherein

i. R^{12} and R^{18} are the same or different and each are hydrogen or alkyl containing 1 to 6 carbon atoms;

ii. R^{13} is alkyl containing 1 to 6 carbon atoms;

iii. R^{14}, R^{15}, R^{17} and R^{19} are the same or different and each are hydrogen, aryl containing 6 to 12 carbon atoms, halogen, nitro, cyano, amino or alkoxy containing 1 to 4 carbon atoms;

c. a radical represented by the formula:

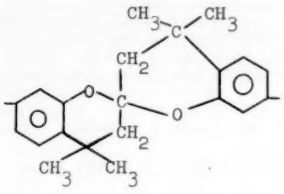


wherein

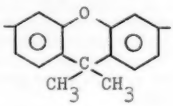
i. R^{19} and R^{24} are the same or different and are each hydrogen or alkyl containing 1 to 12 carbon atoms,

ii. R^{20}, R^{21}, R^{22}, R^{23}, R^{25}, R^{26}, R^{27} and R^{28} are the same or different and are each alkyl having 1 to 6 carbon atoms; with the proviso that R^{20} and R^{26} are the same and R^{21} and R^{25} are the same and that the sum of the carbon atoms in R^{20} and R^{21} equals the sum of the carbon atoms in R^{26} and R^{25} and equals the sum of the carbon atoms in R^{22}, R^{23}, R^{27} and R^{28} plus 2,

d. a radical represented by the formula:

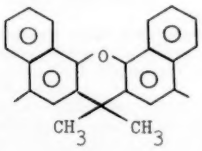


e. a radical represented by the formula:



and

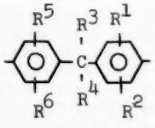
f. a radical represented by the formula:



;

and wherein X is a radical selected from the group consisting of designated radicals (a) through (f) and

g. a radical represented by the formula:



wherein

i. R^1 and R^5 are the same or different and each are hydrogen, aryl containing 6 to 20 carbon atoms, halogen, nitro, amino, cyano or alkoxy containing 1 to 5 carbon atoms;

ii. R^2 and R^6 are the same or different and each are hydrogen, aryl containing 6 to 20 carbon atoms, halogen, nitro, cyano or alkoxy containing 1 to 5 carbon atoms;

iii. R^3 and R^4 are the same or different and each are hydrogen, alkyl containing 1 to 6 carbon atoms, cycloalkyl containing 4 to 6 carbon atoms, or aryl containing 6 to 20 carbon atoms, or R^3 and R^4 taken together with the carbon atom to which they are bonded can be a monocyclic, bicyclic or heterocyclic moiety containing 4 to 7 atoms in the ring;

m represents 1 to 100 mole percent and *n* represents 100-m mole percent.

3,856,527

PROTECTIVE LAYER FOR PHOTOTHERMOGRAPHIC ELEMENTS

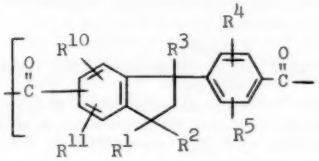
Fredrick L. Hamb, Rochester; Gary L. Hiller, Hilton, and Albert W. Wise, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

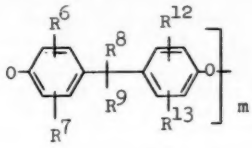
Filed Aug. 6, 1973, Ser. No. 385,935

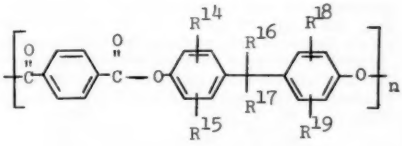
Int. Cl. G03c *5/24*

U.S. Cl. 96—48 HD **12 Claims**

1. In a photothermographic element having a protective layer, the improvement comprising as said protective layer a carboxylic polyester having a glass transition temperature of at least 190°C. having repeating units represented by the formula:







wherein *m* represents 15 to about 100 mole percent and *n* represents 0 to about 85 mole percent;

R^1 and R^3 are each hydrogen atoms or alkyl groups containing 1 to 6 carbon atoms; R^2 is alkyl containing 1 to 6 carbon atoms;

R^4, R^5, R^6, R^7, R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{18} and R^{19} are each hydrogen atoms; aryl containing 6 to 12 carbon atoms; halogen atoms; nitro; cyano; and alkoxy containing 1 to 4 carbon atoms;

R^8, R^9, R^{16} and R^{17} are each hydrogen atoms; alkyl containing 1 to 6 carbon atoms; cycloalkyl; and aromatic radicals containing 6 to 20 carbon atoms, or

R^8 and R^9, taken together with the carbon atom to which they are bonded can be a bridged ring moiety, a fused ring moiety, a monocyclic moiety, or a heterocyclic moiety containing 4 to 7 carbon atoms in the ring, and R^{16} and R^{17}, taken together with the carbon atom to which they are bonded can be a bridged ring moiety, a fused ring moiety, a monocyclic moiety or a heterocyclic moiety containing 4 to 7 carbon atoms in the ring.

3,856,528
COLOR TONED PHOTOPOLYMERIZATION IMAGING PROCESS

Steven Levinos, Chatham, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.

Filed Aug. 10, 1972, Ser. No. 279,580
Int. Cl. G03c 5/34; G03f 7/08
U.S. Cl. 96—49 **4 Claims**

1. In an imaging process which comprises exposing to light through a continuous tone image carrying material a supported layer of photopolymerizable composition comprising an ethylenically unsaturated polymerizable compound, a light-sensitive aromatic diazosulfonate, and a photoreducible dye a time sufficient to effect polymerization in the light-exposed areas of said composition, and separating unpolymerized composition from said layer to thereby form a polymeric image defining such imagewise light exposure, the improvement comprising:

a. including an azo coupler compound in said photopolymerizable composition layer; and

b. subsequent to said image-forming step, contacting the resulting polymeric image with a toning composition including a first compound comprising a ferricyanide ion reducible in the presence of said azo coupler compound, and a second compound comprising an ion selected from ferric and uranyl ions capable of forming a distinct color body with the reduced form of said first compound ion.

3,856,529
METHOD AND MATERIALS FOR MAKING HALF TONE PRINTS

Gunther Schadlich, Wiesbaden-Biebrich; Renate Haenisch, Wiesbaden, and Roland Moraw, Wiesbaden-Biebrich, all of Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Continuation of Ser. No. 732,024, May 27, 1968, abandoned.
This application Sept. 8, 1971, Ser. No. 178,828
Int. Cl. G03c 1/84
U.S. Cl. 96—81 **4 Claims**

1. A light-sensitive material suitable for the production of a printing plate capable of reproducing continuous tones comprising a base, a light-sensitive layer the light-sensitive substance of which is selected from the group consisting of naphthoquinone diazide, iminoquinone diazide, diazido stilbene disulfonic acid, and photopolymerizable compounds on said base, and a contrast layer which presents sufficiently uniformly distributed areas, produced by a material selected from the group consisting of white and yellow opaque pigments, of 0.05 to 10 microns in diameter, the light-transmission capacity of which areas contrasts with that of their immediate environment.

3,856,530
PHOTOGRAPHIC POLYESTER FILM MATERIAL COMPRISING ANTISTATIC LAYER

August Jean Van Paesschen, Antwerpen; Joseph Antoine Herbots, Edegem, and Daniel Maurice Timmerman, Mortsel, all of Belgium, assignors to Agfa-Gevaert, Mortsel, Belgium

Division of Ser. No. 84,926, Oct. 28, 1970, Pat. No. 3,786,002.
This application July 30, 1973, Ser. No. 383,549
Claims priority, application Great Britain, Oct. 29, 1969, 53026/69
Int. Cl. G03c 1/82
U.S. Cl. 96—87 A **8 Claims**

1. Photographic film material comprising a polyester film support, at least one light-sensitive silver halide emulsion layer on one side of the polyester support, and on the other side a layer of an antistatic coating composition for a polyester film support, comprising an homogeneous mixture of (A) a chlorine-containing polymer consisting of at least 70% by weight of at least one monomer taken from vinyl chloride and vinylidene chloride, (B) a polymeric material having electroconductive properties, and (C) about 10 to 20% by weight of a waxy material, the ratio of chlorine-containing polymer to electroconductive polymeric material in said homogeneous mixture varying between 2:1 and 1:2 parts by weight, said composition having a surface resistance at 30% RH of less than 1.10^{10} ohm/10 sq.cm. and at 60% RH less than 1.10^{9} ohm/10 sq.cm.

3,856,531
PHOTOGRAPHIC COMPOSITIONS AND PROCESSES

Patrick J. Grisdale, and Bruce E. Babb, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 168,392, Aug. 2, 1971, Pat. No. 3,767,409.
This application June 4, 1973, Ser. No. 366,884
Int. Cl. G03c 1/52, 1/58, 1/72
U.S. Cl. 96—91 N **6 Claims**

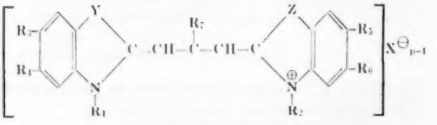
1. An image-forming composition comprising in admixture a radiation-sensitive organoazide which is one of either an aryl azide or a heterocyclyl azide and a triorganophosphine precursor which, on treatment with base, liberates a triorganophosphine that can form a radiation-sensitive complex with the azide.

3,856,532
PHOTOGRAPHIC SILVER HALIDE EMULSION CONTAINING A SUPERSENSITISING COMBINATION

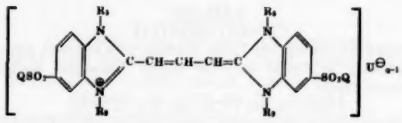
Elvin Frederick William Thurston, and John Gabriel Valentine Scott, both of Ilford, England, assignors to Ilford Limited, Ilford, Essex, England

Filed Apr. 18, 1973, Ser. No. 352,484
Claims priority, application Great Britain, Apr. 26, 1972, 19408/72
Int. Cl. G03c 1/14
U.S. Cl. 96—124 **7 Claims**

1. A photographic silver halide material which contains a super-sensitising combination which consists essentially of a sensitising dye of the formula



wherein R_1 and R_2 are each alkyl groups, or a group A-Q where A is a straight or branched alkylene chain containing 1–6 carbon atoms and Q is an amide, carboxylic acid or sulphonic acid group, R_3, R_4, R_5 and R_6 are the same or different and each represents a hydrogen or halogen atom, or an alkyl, aryl, hydroxy or alkoxy group, R_7 is a lower alkyl group, Y and Z are each sulphur or selenium atoms or one is an oxygen atom and the other is a sulphur or selenium atom, X is an anion and p is 1 in the case of a betaine-like molecular structure caused by the presence of a sulphonic acid in either or both R_1 and R_2 or by the presence of a carboxylic acid in both R_1 and R_2 and is 2 in the case of a non-betaine-like molecular structure, together with a symmetrical trimethincyanine dye of the formula



wherein R_8 is an alkyl group and R_9 is an alkyl, aryl, sulphoalkyl, hydroxyalkyl, carboxyalkyl, aralkyl or carboxybenzyl group, or an acylsulphamoylalkyl group of the formula $-(CH_2)_n SO_2 NHCOR_{10}$ where n is an integer from 1 to 6 and R_{10} is an alkyl group, or an alkyl or aralkyl sulphamoylalkyl group of the formula $-(CH_2)_n SO_2 NHR_{11}$ where n is an integer from 1 to 6 and R_{11} is an alkyl or aralkyl group, Q is a phenyl or phenyl substituted with at least one halogen, alkyl or alkoxy substituent, U is an anion and q is 1 in the case of a betaine-like molecular structure caused by the presence of a sulphonic acid or carboxylic acid group in R_9 and is 2 in the case of a non-betaine-like molecular structure.

3,856,533
SURFACE POLISHES BASED ON ORGANOPOLYSILOXANES AND WAX

Karl Schnurrbusch, Leverkusen-Steinbuechel, and Peter Preiss, Wuppertal, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

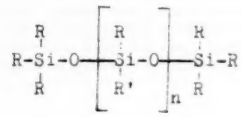
Filed Dec. 28, 1973, Ser. No. 429,310

Claims priority, application Germany, Jan. 4, 1973, 2300245

Int. Cl. C08h *9/06*; **C09g** *1/08*

U.S. Cl. 106—10 **5 Claims**

1. A polish for glass, stone, plastic, metal, paint and the like, especially for lacquered metal surfaces, comprising, as its base, an organopolysiloxane-wax polishing composition, which polish is improved by an additional content of 2 to 40 per cent by weight, calculated on said composition, of an organosiloxane of the general formula



wherein

n is zero or an integer from 1 to 12,

R' is R or $-OSiR_3$, and

each R is a hydrocarbon radical having up to 18 carbon atoms, individually selected from the group consisting of alkyl, alkenyl and monocyclic aryl, but chosen with the proviso that in said additional organosiloxane of the above formula the numerical ratio of the sum of all carbon atoms to the sum of all silicon atoms is from 4 : 1 to 20 : 1.

3,856,534
ANTI-FOG COMPOSITION

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Harry D. Morrison, and Dorrie L. Carmin, Jr., both of Seabrook, Tex.

Continuation-in-part of Ser. No. 69,488, Sept. 3, 1970, abandoned. This application Sept. 8, 1971, Ser. No. 178,771

Int. Cl. C09k *3/00, 3/18*

U.S. Cl. 106—13 **38 Claims**

1. An anti-fog composition for application to viewing surfaces consisting essentially of from about 6.8 to 23.8 parts by volume of a surface active agent; from 11.7 to 62.3 parts by volume of water; and from 0.5 to 15 parts by volume of an oil time extender selected from the group consisting of a substantially water-insoluble organopolysiloxane having the formula $(R_2SiO)_n$ wherein R is an aliphatic or aromatic hydrocarbon group having from about 1 to 8 carbon atoms and wherein n ranges from 2 to 20 and an organophosphate ester having the formula R_3PO_3 wherein R is an aliphatic or aromatic hydrocarbon group having from about 1 to 8 carbon atoms.

3,856,535
EMULSIFIABLE HALOALKYL PHOSPHATE BLEND FOR AQUEOUS TEXTILE FLAME-RETARDANT TREATMENTS

Christopher A. Ferguson, Wilmington, Del., assignor to ICI America Inc., Wilmington, Del.

Filed Dec. 6, 1973, Ser. No. 422,521

Int. Cl. C09d *5/18*

U.S. Cl. 106—15 FP **9 Claims**

1. A textile flame retarding treating agent blend useful in making stable aqueous emulsions consisting essentially of:

a. a flame retarding agent having the general formula $(XH_2C-CHXCH_2O)3-PO$ and $[XH_2C-CH(CH_2X)O]_3-PO$ wherein X is chlorine or bromine, and

b. 5 – 20 percent by weight of said flame retarding agent of an emulsifier having an HLB of 14.5 – 18.7 which comprises ethoxylated or propoxylated fatty acid esters of glycerol having a high average molecular weight of 6,500 – 14,000 and up to 150 percent by weight of said high molecular weight fatty acid ester of a low molecular weight fatty acid ester of glycerol, sorbitol, or sorbitan and ethoxylated or propoxylated fatty acid esters of glycerol, sorbitol, or sorbitan having a molecular weight in the range of 1,000 – 6,500 and wherein said fatty acid moiety in said esters have 10 – 22 carbon atoms.

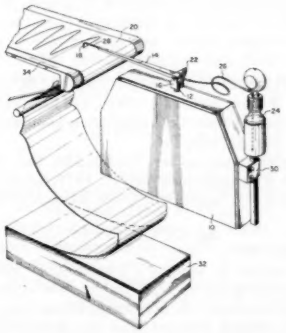
3,856,536
LOW-PRESSURE INKING SYSTEM AND INK THEREFOR

Abe Siegelman, Morton Grove; Robert N. Quoss, Clarendon Hills, and Raymond M. Pawlak, Addison, all of Ill., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation-in-part of Ser. No. 263,699, June 16, 1972, , which is a continuation of Ser. No. 50,652, June 29, 1970, abandoned. This application Aug. 20, 1973, Ser. No. 389,682

Int. Cl. C09d *11/00*

U.S. Cl. 106—22 **4 Claims**



1. A low-viscosity ink designed for use in a low-pressure writing system comprising a major proportion of water containing 20 to 35 percent by weight ethylene glycol monomethyl ether, a water-soluble coloring agent and a water-soluble resin selected from polyvinylpyrrolidone and polyethylene oxide, the amount of polyvinylpyrrolidone being 0.1 to 5 percent by weight and the amount of polyethylene oxide being 0.01 to 0.3 percent by weight.

3,856,537

BORON-SILICON COMPOSITION AND METHOD OF MAKING SAME

Raymond A. Busch, Richland, Wash., assignor to Battelle Development Corporation, Columbus, Ohio

Filed Mar. 7, 1973, Ser. No. 338,902
Int. Cl. C04b 35/58
U.S. Cl. 106—55 2 Claims

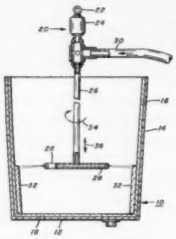
1. A metastable boron-silicon composition containing up to about 20 atom percent silicon and the balance boron, having a hardness of at least about 3,500 DPH.

3,856,538

REFRACTORY LINING FOR HOT METALLURGICAL LADLES, SOAKING PITS AND FURNACES

Crawford B. Murton, 1906 Brushcliff Road, Pittsburgh, Pa. 15221

Division of Ser. No. 77,059, Oct. 1, 1970, Pat. No. 3,737,489. This application Jan. 4, 1973, Ser. No. 320,893
Int. Cl. C04b 35/14
U.S. Cl. 106—68 9 Claims



1. A refractory composition suitable for application use at temperatures ranging from about 400° F. to about 2,800° F. and being capable of being applied to hot vessels by projection, the composition consisting essentially of, by weight, from about ¼% to about 4% of organic material selected from a group consisting of pitch, tar, rosins, polyvinylchloride, polyethyltetrachloride, and mixtures thereof, from about 40% to about 70% of bonding clay, and from about 28% to about 58% of quartzite.

3,856,539

SOLIDIFIED SILICA FOAM PRODUCT AND PROCESS

William A. Mallow; Richard A. Owen, and Ethelbert J. Baker, Jr., all of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Continuation-in-part of Ser. No. 102,504, Dec. 28, 1970, abandoned. This application Nov. 12, 1971, Ser. No. 198,279
Claims priority, application Great Britain, Dec. 4, 1970, 57615/70
Int. Cl. C04b 35/16
U.S. Cl. 106—75 19 Claims

1. In a method for making a foamed alkali metal silicate product including the step of frothing into a foam by gas entrainment a composition comprising an aqueous solution of alkali metal silicate selected from the group consisting of sodium silicate and potassium silicate, together with a surface tension depressant, a silicon dioxide polymer forming agent being introduced into the composition in an amount sufficient to make the foam rigid and resistant to degradation by water, shaping the frothed product, and hardening the shaped product in a polymerization zone, the improvement comprising permitting the frothed product to harden free of damaging contraction or expansion, under conditions of high humidity, approaching 100% relative humidity.

3,856,540

CEMENT ADDITIVE

Tsutomu Mizunuma, and Takeo Yoshida, both of Ohmi, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1973, Ser. No. 327,556
Claims priority, application Japan, Jan. 28, 1972, 47-10312
Int. Cl. C04b 7/02
U.S. Cl. 106—89 2 Claims

1. A cement additive comprising calcium sulfate from 20 to 90% by weight and calcium fluoroaluminate having the chemical formula $3CaO{\cdot}3Al_2O_3{\cdot}CaF_2$ from 80 to 10% by weight.

3,856,541

HYDRAULIC CEMENT AND METHOD OF CEMENTING IN ENVIRONMENTS HAVING ELEVATED TEMPERATURES

Robert C. Martin, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 138,339, April 28, 1971, abandoned, which is a continuation-in-part of Ser. No. 106,560, Jan. 14, 1971, abandoned. This application Sept. 8, 1972, Ser. No. 287,458
Int. Cl. C04b 7/02
U.S. Cl. 106—90 6 Claims

1. In the method of emplacing an aqueous hydraulic cement slurry into an environment having an elevated temperature of at least about 200° F which temperature would normally cause a premature setting of the hydraulic cement, the improvement which comprises:

admixing with said hydraulic cement slurry a water soluble alkali or alkaline earth metal salt of a boron containing hydroxycarboxylic acid in an amount ranging from about 0.1 to about 10 parts by weight per 100 parts by weight of dry cement to retard the setting rate of said hydraulic cement slurry at said elevated temperature.

3,856,542

PROCESS FOR THE PRODUCTION OF IMPROVED CEMENT

Alois Aignesberger, and Hans-Gunter Rosenbauer, both of Trostberg, Upper Bavaria, Germany, assignors to Suddeutsche Kalkstickstoff-Werk Aktiengesellschaft, West Germany

Filed Aug. 13, 1973, Ser. No. 387,668
Claims priority, application Germany, Nov. 8, 1972, 2254668
Int. Cl. C04b 7/54
U.S. Cl. 106—102 4 Claims

1. Process for the production of improved cement comprising,

addition of aqueous solution of a melamine formaldehyde condensation product to ground dry cement in an amount of 0.1 to 2 weight per cent of condensation product with respect to the dry cement by spraying the solution into the fine grinding compartment of a cement grinding mill of a cement production plant, and wherein the concentration of the solution of the condensation product as a function of temperature and dwell time of the material in the fine grinding compartment is controlled so that the retention time required for complete evaporation of the water is not substantially exceeded by total grinding time.

3,856,543

CONTROLLING SETTING OF PLASTERS

Maurice Allen, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 25, 1973, Ser. No. 409,451

Claims priority, application Great Britain, Oct. 31, 1972, 50155/72

Int. Cl. C04b *11/00*

U.S. Cl. 106—110 9 Claims

1. Method of controlling the setting time of calcium sulphate hemihydrate and a preselected quantity of water, which comprises the steps of intimately mixing with part of the water at least one calcium compound adapted to react with sulphuric acid to form calcium sulphate, intimately mixing sulphuric acid with the calcium compound and water mixture, partially reacting the sulphuric acid and calcium compound, and then during said reaction intimately mixing solid calcium sulphate hemihydrate with the reacting mixture, the total amount of water in the final mixture being equal to the said preselected quantity of water.

3,856,544

FIBER-REINFORCED CALCIUM SILICATE HYDRATE INSULATION

Stanley G. Benner, Littleton, Colo., and Kenneth F. Greene, Somerville, N.J., assignors to Johns-Manville Corporation, Arapahoe County, Colo.

Filed Aug. 6, 1973, Ser. No. 386,132

Int. Cl. C04b *15/06*

U.S. Cl. 106—120 9 Claims

1. In a process for reacting lime and a siliceous material under hydrothermal conditions in aqueous solution to produce an aqueous slurry of calcium silicate hydrate crystals, with subsequent molding of the crystals to a desired shape and drying of the shape-molded product to form a shaped object of light weight calcium silicate hydrate suitable for use as thermal insulation, the improvement which comprises incorporating into said aqueous slurry of calcium silicate hydrate crystals 1 to 10% by weight based on solids of poly(ethylene terephthalate) fibers, said fibers having a length of from ⅛ to 1 inch and a denier of from 0.5 to 5.

3,856,545

PIGMENTARY COMPOSITION

Thomas Howard Ferrigno, 29 Clover Hill Cir., Trenton, N.J. 08638

Continuation of Ser. No. 164,416, July 20, 1971, abandoned. This application Nov. 15, 1972, Ser. No. 306,926

Int. Cl. C08h *17/02*

U.S. Cl. 106—288 B 11 Claims

1. A white appearing pigmentary composition comprising calcined agglomerates consisting of from about 90 to 99 parts by weight of anhydrous silicates selected from the group consisting of silica, the silicates of berylium, magnesium and calcium, aluminosilicates, the alumino-silicates of lithium, berylium, magnesium, barium, sodium, potassium and calcium; and mixtures thereof; 1 to 10 parts by weight of an inorganic binder selected from the group consisting of glassy sodium polyphospates having from about 4 to 100 phosphorous atoms per molecule, expanding lattice montmorillonites, soluble silicates of sodium, potassium and lithium, and mixtures thereof, said anhydrous silicates consisting of particles having an average size ranging from about 2 to 40 microns and said agglomerates ranging in size from about 20 microns to 1 centimeter.

3,856,546

NON-TOXIC COMPOSITIONS FOR USE IN PRIMER COATING FORMULATIONS

Gerald L. Weiss, Freehold, N.J., assignor to N L Industries, Inc., New York, N.Y.

Filed Aug. 1, 1972, Ser. No. 277,139

Int. Cl. C09c *1/36;* C08h *17/04*

U.S. Cl. 106—300 7 Claims

1. A component for use in a primer formulation adapted to be applied to cedar or redwood substrates to prevent staining said component intimately associated with a non-toxic tin composition comprising from 4.9 to 7.0 percent hydrous stannous oxide, calculated as SnO, containing absorbed, unreacted stannous salt yielding stannous ions in said primer formulation for reacting with the staining agents of said cedar or redwood substrates to form insoluble compounds with said agents.

3,856,547

PROCESSING AIDS FOR POLY(VINYL CHLORIDE) RESINS

Erwin Aron, Clifton, N.J., assignor to Technical Processing, Inc., Paterson, N.J.

Filed Oct. 16, 1973, Ser. No. 407,033

Int. Cl. C08f *45/44;* C08k *1/44*

U.S. Cl. 106—316 5 Claims

1. A composition comprising an admixture consisting essentially of:

a. from about 50 to about 70 weight percent of at least one monoalkyl phenoxy polyethylene glycol having from about 8 to about 12 carbons in the alkyl group thereof and from about 3 to about 7 ethyleneoxy units;

b. from about 15 to about 25 weight percent of at least one amine or ammonium salt of an organic acid having a vapor pressure of not greater than 1 mm Hg at 20°C. selected from the group consisting of monoamine salts of monohydric organic acids or molecular weight of at least 146 and polyethylene polyamide salts of such acids where said polyethylene polyamide has at least 4 ethyleneamine units, there being one acid residue for each amine nitrogen of said polyalkylene polyamine; and

c. from about 5 to about 25 weight percent of at least one amide having a vapor pressure of not greater than about 1 mm Hg at 20°C. selected from the group consisting of N-lower alkyl and N-hydroxy lower alkyl substituted higher amides of from about 10 to about 80 carbons and amides of monohydric organic acids of molecular weight of at least 146 and polyethylene polyamines having at least 4 ethyleneamine units, there being one acid residue for each amine nitrogen.

3,856,548

STRIPPABLE OVERCOATING FOR IMPROVED XEROGRAPHIC PLATES

Thomas W. Taylor, Marion; Anthony J. Ciuffini, and Paul L. Gerace, both of Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 5, 1973, Ser. No. 321,165

Int. Cl. C03g *13/22*

U.S. Cl. 117—6 11 Claims

1. A method of making a photoreceptor member which comprises:

a. vacuum depositing a layer of photoconductive material onto a supporting substrate,

b. forming a strippable organic overcoating over said photoconductive layer following vacuum deposition; and

c. stripping off said overcoating whereby dust, dirt and other foreign material is trapped within the strippable coating and removed from the surface of said photoconductive layer.

3,856,549

METHOD FOR STABILIZING POLYBENZIMIDAZOLES

Richard J. Dauksys, 49 Nuthatch Knob, Bellbrook, Ohio 06033

Filed June 4, 1973, Ser. No. 366,912
Int. Cl. B44d *1/06, 5/06*
U.S. Cl. 117—33.3 6 Claims

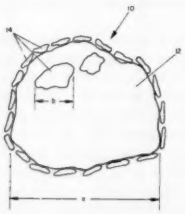
1. A process for stabilizing a shaped article of a polybenzimidazole against degradation by ultraviolet light which comprises immersing the article for a period ranging from 5 minutes to 5 hours in a solution comprising osmium tetroxide and a solvent therefor selected from the group consisting of ethyl ether, pyridine and dioxane, the amount of osmium tetroxide in solution ranging from about 0.05 to 1.0 gram per liter of solution and the solution being at a temperature ranging from about 20 to 100°C.

3,856,550

FLUORESCENT VISUAL AUGMENTATION COMPOSITION

Everett M. Bens, and Lloyd J. Holt, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 56,941, July 21, 1970, abandoned. This application Sept. 12, 1973, Ser. No. 396,650
Int. Cl. C09k *1/02*
U.S. Cl. 117—33.5 R 2 Claims



1. A method for preparing composite articles which, when released in the air in a large group, will form a highly visible cloud which descends slowly, said method comprising the steps of:

a. placing, in a container, a plurality of inert dry carrier particles selected from the group consisting of talc, expanded mica, magnesia, silica gel, diatomaceous earth, bakelite, expanded vermiculite, calcium silicate, alumina and silica, said particles having diameters such that the particles will pass through a screen of from 30 to 300 mesh;

b. adding a plurality of dry daylight fluorescent pigment particles having diameters in the range of from 0.5 to 2.5 microns to said container which contains said carrier particles, said daylight fluorescent pigment particles being added in the weight percentage range of from 12.5 weight percent pigment per 87.5 weight percent carrier particles to 50 weight percent pigment per 50 weight percent carrier particles; and said daylight fluorescent pigment particles being prepared by a method selected from that of coloring a resin in the fused state with a rhodamine dye and that of dyeing a powdered resin or resin precipitate in a dyebath with a rhodamine dye and then reducing the colored or dyed resin to particles having diameters in the range of from 0.5 to 2.5 microns; and

c. mixing said carrier particles and said daylight fluorescent pigment particles together until a plurality of composite articles each made up of an inner carrier particle and a plurality of outer pigment particles coating the carrier particle and held thereto by means of electrostatic attraction, friction forces, van der Waals forces, gravitational forces or a combination thereof are formed and all of the material in said container appears visually to have taken on the color of said daylight fluorescent pigment particles.

3,856,551

PRESSURE SENSITIVE COPYING PAPER

Frank Llewellyn Jenkins, Chesham, England, assignor to Wiggins Teape Research & Development Limited, London, England

Continuation-in-part of Ser. No. 886,741, Dec. 19, 1969, abandoned. This application Jan. 3, 1972, Ser. No. 215,079
Claims priority, application Great Britain, Dec. 24, 1968, 61358/68
Int. Cl. B41m *5/22*
U.S. Cl. 117—36.2 5 Claims

1. In a web or sheet of paper having on a surface thereof a coating capable of developing a colour former from the colourless to a coloured form, in which the coating includes fine particles of inorganic acidic, oil-absorptive, mineral material and an organic, acidic polymer, the improvement comprising the mineral particles being silica having a surface area greater than 100 m^2/g and being individually coated with an organic, acidic polymer containing phenolic hydroxyl groups, which polymer is reactive with the colour-former to develop it to the coloured form and is coated on the particles in an amount sufficient to develop the colour-former to the coloured form.

3,856,552

COLOR PROJECTION TRANSPARENCIES

Frank L. Deyak, Stillwater, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Apr. 2, 1973, Ser. No. 347,194
Int. Cl. B41c *1/06;* B41m *5/18*
U.S. Cl. 117—36.2 5 Claims

1. Sheet material, which rapidly develops a longlasting color when first briefly subjected to vapors of salicylic acid, having an active color-forming stratum comprising a mixture of (A) a protonatable chromogenous dye-forming color progenitor and (B) a substantially colorless oxidizable Nhydrocarbyl-substituted dihydroheterocyclic amine precursor of a styryl or cyanine dye.

5. A copy-sheet assembly useful in making a color projection transparency copy of a graphic original by the thermographic copying process and consisting of a color-forming film member and an acid source sheet releasably tabbed together along one common margin in face-to-face relationship and an acid-impervious separator sheet removably positioned therebetween, and wherein said color-forming member includes a transparent carrier film coated with a mixture in a polymeric binder of a protonatable chromogenous dye-forming color progenitor and an oxidizable N-hydrocarbyl-substituted dihydroheterocyclic amine precursor of a styryl or cyanine dye.

3,856,553

LIGHT-RESISTANT-COLOR DEVELOPING SHEET FOR PRESSURE-SENSITIVE COPYING PAPER

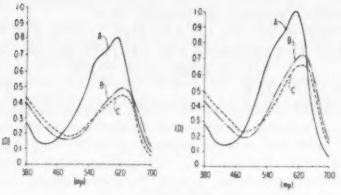
Takao Hayashi; Hiroharu Matsukawa, and Masataka Kiritani, all of Fujimiya, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 151,046, June 8, 1971, abandoned. This application Oct. 29, 1973, Ser. No. 410,574
Claims priority, application Japan, June 8, 1970, 45-49339
Int. Cl. B41c *1/06*
U.S. Cl. 117—36.2 10 Claims

1. A color developing sheet for pressure-sensitive copying paper comprising a support and a developer layer coated thereon, said developer layer comprising an alkaline substance selected from the group consisting of an alkali metal hydroxide and an alkali metal carbonate, in addition to a clay and a phenol compound in which the hydrogen atom bonded to the aromatic ring is substituted with at least one hydroxyl group,

said alkaline substance being present in an amount of from 0.2 to 30 parts by weight per 100 parts by weight of said clay and said phenol compound being present in an amount of from 1 to 10 parts by weight per 100 parts by weight of clay.

2. A color developing sheet according to claim 1, wherein said phenol compound is a member selected from the group consisting of p-t-butyl phenol, p-t-amyl phenol, p-cresol, p-



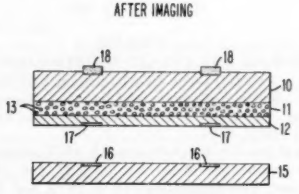
nonylphenol, p(p-bromophenyl) phenol, biphenyl phenol, 2,4-xylenol, 2,4-diphenyl phenol, 2-chloro-4-phenyl phenol, 2,3,5-trimethyl phenol, tetramethyl phenol, 4-phenyl pyrocatechol, o,o'-biphenol, 4,4'-bi-o-cresol, α, α'-diphenyl-4,4'-bi-o-cresol, biphenyl tetrol, 2,4'-methylene diphenol, methylene diresorcinol, 2,2-methylene di-p-cresol, methylene bis-(benzylphenol), methylene bis-(phenyl phenol), methylene bis-(halo-phenol), and 4,4'-thiodiphenol.

3,856,554

PRESSURE-SENSITIVE CARBONLESS TRANSFER SHEET AND METHOD FOR PROVIDING A CHEMICALLY FORMED IMAGE ON AN UNTREATED SUBSTRATE

Richard B. Jablonski, Lambertville, N.J., and James F. Martone, Lexington, Ky., assignors to International Business Machine Corporation, Armonk, N.Y.

Filed Apr. 16, 1973, Ser. No. 351,710
Int. Cl. B41m *5/00*
U.S. Cl. 117—36.8 **11 Claims**



1. A pressure-sensitive carbonless transfer sheet having a surface supporting a multitude of microscopic pressure-rupturable capsules containing a reactant solution comprising a precursor taken from the class of dithiooxamide and its N,N'di-substituted derivatives, and a solvent and also supporting a co-reactant for the reactant solution, which co-reactant comprises nickel (II) chloride, sodium ricinoleate and stearic acid,

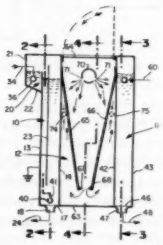
the reactant solution and co-reactant being adapted, upon application of a localized pressure to the sheet and consequently rupture of the capsules while said surface is in intimate contact with another surface devoid of reactant and co-reactant, to cause a substantial portion of the co-reactant and reactant solution to physically transfer to said other surface to cause chemical reactions to occur between the precursor and co-reactant for rapidly providing a dry, chemically formed image on such other surface.

3,856,555

METHOD FOR DRYING AN ELECTROPHOTOGRAPHIC SUPPORT ELEMENT

Arthur R. Mandeville, South Hadley, Mass., assignor to Scott Paper Company, Delaware County, Pa.

Division of Ser. No. 140,889, May 6, 1971, Pat. No. 3,724,096.
This application Jan. 8, 1973, Ser. No. 321,817
Int. Cl. F26b *13/00*; **G03g** *13/20*, *15/20*
U.S. Cl. 117—37 LE **5 Claims**



1. A method for drying an electrophotographic support element containing on its front surface a latent electrostatic image which has been toned and rendered visible by immersion of said support element in a developing solution comprising a mixture of charged toner particles in a carrier liquid, comprising

placing said support element carrying the developed image on a downwardly inclined foraminous member so that its back surface contacts said foraminous member and its front surface is directed away from said foraminous member, and

circulating relatively cool air over said front surface and said back surface so as to evaporate said carrier liquid and to leave said toner particles attached to said support element.

3,856,556

PROCESS FOR THE MANUFACTURE OF CHEMICAL RESISTANT POLYARYLATE FILMS AND COATINGS

Zbigniew K. Brzozowski; Stanislaw Porejko; Janusz Kaczorowski, and Jedrzej Kielkiewicz, all of Warszawa, Poland, assignors to Politechnika Warszawska, Warszawa, Poland

Filed Mar. 8, 1973, Ser. No. 339,053
Claims priority, application Poland, Mar. 15, 1972, 154073; Apr. 27, 1972, 155001
Int. Cl. B44d *1/46*
U.S. Cl. 117—62 **4 Claims**

1. A process for the manufacture of a chemical resistant, self-extinguishing polyarylate film or coating formed from a polyarylate based on a chlorobisphenol or ester thereof in which the carbon atom between two aryl rings with substituents or without substituents is connected by a double bond to a CCl_2 group comprising subjecting said film or coating to a temperature of 135°–320°C for 1 to 10 hours.

2. A process according to claim 1 wherein the polyarylate is the condensation product of said chlorobisphenol or a mixture of said chlorobisphenol with a bis(hydroxyaryl)alkane and at least one dicarboxylic acid chloride or ester.

3,856,557

PROCESS FOR FORMING A MANGANESE BISMUTHIDE FILM

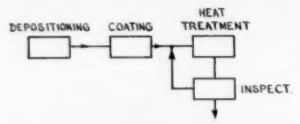
Willis Robert Cuttell, Pagnell, and Norman Nathan Truman, Enfield, both of England, assignors to International Computers Limited, London, England

Filed Oct. 2, 1972, Ser. No. 294,069

Claims priority, application Great Britain, Oct. 1, 1971, 45773/71

Int. Cl. C23c *13/02*

U.S. Cl. 117—71 R 7 Claims



1. A process for the formation of a film of intermetallic manganese bismuthide on a substrate comprising the steps of; depositing under vacuum at a first pressure level manganese and bismuth on to the same region of the substrate; depositing under a vacuum at a second pressure higher than the first level an air impervious layer which is chemically inert to the manganese and bismuth to encapsulate the manganese and the bismuth; tranferring the substrate to a heating zone, and converting the manganese and bismuth into an intermetallic manganese bismuthide by heating the manganese and bismuth under ambient pressure conditions for at least 2 hours at a temperature of approximately 200°c.

3,856,558

TREATMENT OF CELLULOSE

Edward Robbart, 321 Fairmount Ave., Milton, Mass. 02186

Continuation-in-part of Ser. No. 308,057, Nov. 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 39,538, May 21, 1970, abandoned, which is a continuation-in-part of Ser. No. 522,366, Jan. 24, 1966, abandoned. This application Aug. 8, 1973, Ser. No. 386,622

Int. Cl. C23c *11/00*

U.S. Cl. 117—106 R 20 Claims

1. The process for rendering a cellulosic material water repellent which comprises contacting a cellulosic material having a water content between about 2 and 7 weight percent with vapors of a lower alkyl silicon halide which reacts with water to form a siloxane, maintaining the cellulosic material and lower alkyl silicon halide in contact between about 0.1 and 8 seconds, the concentration of lower alkyl silicon halide and the temperature at which the contact is conducted being maintained so that the cellulosic material contacted with the lower alkyl silicon halide is rendered water repellent and has a pH greater than 2.5.

3,856,559

METHOD OF MANUFACTURING COMPOSITE FILMS OF HEAT RESISTING POLYMERS

Keisuke Nakagome, Osaka, Japan, assignor to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Sept. 28, 1972, Ser. No. 293,181

Claims priority, application Japan, Sept. 30, 1971, 46-76996

Int. Cl. B44d *1/44*

U.S. Cl. 117—119.6 8 Claims

1. A method of manufacturing a heat adhesive composite film of a heat resisting polymer having thereon a heat softenable adhesive layer comprising

applying a solution of a cresol-soluble, heterocyclic ring-containing polymer to at least one surface of a heat resisting support film formed from a solution of a heterocyclic ring-containing polymer which is insoluble in a cresol but soluble in an aprotic polar solvent,

drying said coated layer to a residual solvent content of 20% by weight or less based on the weight of the solid content in said coated layer.

3,856,560

ARYLENE SULFIDE POLYMER COATING COMPOSITIONS

Jennings P. Blackwell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 177,130, Sept. 1, 1971, Pat. No. 3,776,880. This application Aug. 15, 1973, Ser. No. 388,598

Int. Cl. B32b *15/08, 27/06*

U.S. Cl. 117—132 B 7 Claims

1. A coated structure comprising a substrate having bonded thereto a coating composition comprising a poly(arylene sulfide) resin and a finite amount up to 50 weight percent, based on resin, of at least one nitrogenous organic compound selected from melamine, hexamethylenetetramine, benzothiazole, 1H-benzotriazole, casein, and an ammonium salt of casein, and mixtures thereof.

3,856,561

RUBBER ARTICLES HAVING IMPROVED SLIP COATING

Pascal E. Esemplare, Mountainside, N.J., and Dennis Beeferman, Brooklyn, N.Y., assignors to Sutures, Inc., Coventry, Conn.

Filed Jan. 25, 1972, Ser. No. 220,692

Int. Cl. B32b *25/08*

U.S. Cl. 117—139 3 Claims

1. An article including a rubber surface provided with a slip coating, said slip caoting consisting essentially of a copolymer selected from the group consisting of vinyl chloride-alkyl acrylate copolymer and vinylidene chloride-alkyl acrylate copolymer, said copolymer comprising from 20 to 80 mole percent vinyl chloride or vinylidene chloride units and, correspondingly, 80 to 20 mole percent alkyl acrylate units.

3,856,562

METHODS FOR TREATING FIBERBOARD WITH AMINOPLAST COPOLYMER BLENDS

James T. White, Cottondale, and Donald L. Gumprecht, Tuscaloosa, both of Ala., assignors to Reichhold Chemicals, Inc., White Plains, N.Y.

Division of Ser. No. 282,939, Aug. 23, 1972, abandoned, which is a continuation of Ser. No. 107,583, Jan. 18, 1971, abandoned. This application Feb. 5, 1973, Ser. No. 329,449

Int. Cl. D21h *1/40*

U.S. Cl. 117—140 A 6 Claims

1. A method for increasing the sag resistance of fiberboard panels by treating the surface of said fiberboard panels with a liquid thermosetting resin blend of liquid thermosetting copolymers consisting essentially of (1) from about 25% to about 55% by weight, based upon the total weight of (1) and (2), of a melamine-formaldehyde copolymer, said copolymer having a mole ratio of melamine to formaldehyde of about 1.0:2.5 (2) from about 75% to about 45% by weight, based upon the total weight of (1) and (2), of a urea-formaldehyde copolymer, said copolymer having a mole ratio of urea to formaldehyde of about 1.0:1.9 and (3) from about 0.05% to about 0.5% by weight, based upon the combined weight of (1) and (2), of an ammonium hydroxide-sodium hydroxide stabilizer, said stabilizer having a ratio of concentrated liquid ammonium hydroxide to a 50% by weight aqueous solution of sodium hydroxide of about 2.0:1.0 and thermosetting said blend.

3,856,563

OPACITY OF CLAY FILMS

William E. Zentz, Jr., Iselin, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Woodbridge, N.J.

Division of Ser. No. 270,498, July 10, 1972, Pat. No. 3,816,153. This application Mar. 18, 1974, Ser. No. 451,954
Int. Cl. D21h 1/10
U.S. Cl. 117—152 5 Claims

1. In the preparation of clay-coated paper wherein a coating composition comprising water, kaolin clay, adhesive binder and clay deflocculating agent is prepared and the composition is coated on paper and dried, the improvement which comprises incorporating a small amount of a hydrolyzable bismuth (+3) salt with the clay before an aqueous slip of said clay is deflocculated, the amount of said salt being sufficient to increase the opacity of a sheet coated with said coating composition.

3,856,564

PAPER COATED WITH CLAY AND ASBESTOS

William Brian Kirkham, Montreal, Quebec, Canada, assignor to Domtar Limited, Montreal, Canada

Continuation-in-part of Ser. No. 222,399, Jan. 31, 1972, abandoned. This application Aug. 7, 1973, Ser. No. 386,391
Int. Cl. D21h 1/28
U.S. Cl. 117—155 UA 3 Claims

1. A coated paper comprising a substrate of paper and a coating consisting essentially of clay and asbestos and a binder, said asbestos being present in the amount of 0.1 to 10 percent based on the weight of the clay said binder being present in the amount of 10 percent – 20 percent based on the weight of said clay, and said coating being uniformly distributed over at least one surface of the substrate.

3,856,565

METHOD OF ELECTROLESSLY PLATING A METAL TO A BODY WHICH INCLUDES LEAD

Anthony Francis Arnold, Ringoes, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 3, 1973, Ser. No. 355,671
Int. Cl. C23c 3/00
U.S. Cl. 117—212 4 Claims

1. In a method of depositing a metal electrolessly from a plating bath, on a surface of a body a portion of which surface contains a lead compound, the step of activating said surface with a solution separate from the plating bath, that includes, in addition to the activating substance, a substance that reacts with lead ions to form an insoluble lead compound such that the lead is converted to a condition in which it cannot poison said activating substance.

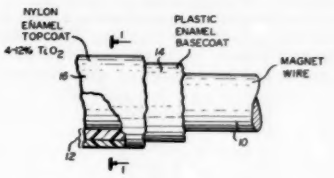
3,856,566

METHOD OF MAKING INSULATED MAGNET WIRE

Hollis S. Saunders, Ballwin, Mo., assignor to General Cable Corporation, New York, N.Y.

Continuation of Ser. No. 256,440, May 24, 1972, abandoned. This application Feb. 28, 1973, Ser. No. 336,781
Int. Cl. H01b 7/02
U.S. Cl. 117—218 10 Claims

1. The method of making insulated magnet wire having a slick, smooth surface with a low coefficient of friction suitable for winding the wire on high speed winding machines, which method comprises providing an electrical conducting wire, preparing a nylon enamel containing titanium dioxide dispersed in the enamel, the titanium dioxide being about 20 to 40 percent of the weight of the solids in the enamel and imparting a slick, smooth surface to the enamel, applying insulation around the wire to the thickness necessary for the intended service conditions and with said enamel applied as at least part of the insulation, and obtaining the slick, smooth



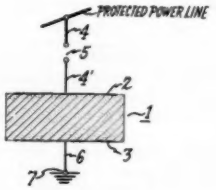
surface by applying the insulation so as to have the nylon enamel constitute the outside surface of the insulation.

3,856,567

ELECTRODE FOR POROUS CERAMIC AND METHOD OF MAKING SAME

John J. Pitha, 165 Walker St., Lenox, Mass. 01240, and Howard F. Ellis, Rte. 22, Stephentown, N.Y. 12168

Continuation-in-part of Ser. No. 277,887, Aug. 4, 1972, abandoned. This application Oct. 4, 1973, Ser. No. 403,621
Int. Cl. B44d 1/02
U.S. Cl. 117—221 10 Claims



1. A method of forming an electrode on a porous ceramic substrate comprising the steps of:

applying to the surface of a porous, granular substrate a layer of a finely divided titanium oxide;

heating the substrate with the applied layer in a reducing atmosphere to a temperature of between 1,200° to 1,300°C until the titanium oxide is reduced more than it is in its stoichiometric state and becomes relatively conductive, and

cooling the substrate to room temperature.

3,856,568

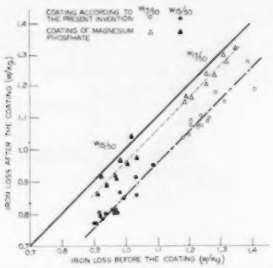
METHOD FOR FORMING AN INSULATING FILM ON AN ORIENTED SILICON STEEL SHEET

Osamu Tanaka; Takaaki Yamamoto, and Toshihiko Takata, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Sept. 27, 1972, Ser. No. 292,715
Claims priority, application Japan, Sept. 27, 1971, 46-75233
Int. Cl. C22c 39/46; H01f 27/24
U.S. Cl. 117—70 B 5 Claims

1. A method for forming an insulating film on an oriented silicon steel sheet, comprising the steps of applying to the oriented silicon steel sheet a coating solution composed of 4 to 16 wt. percent of colloidal silica, 3 to 24 wt. percent of aluminum phosphate, calculated as aluminum biphosphate,

and 0.2 to 4.5 wt. percent of at least one compound selected from the group consisting of chromic anhydride and chromate


COATING ACCORDING TO THE PRESENT INVENTION
COATING OF MAGNESIUM PHOSPHATE
IRON LOSS AFTER THE COATING (g/kg)
IRON LOSS BEFORE THE COATING (g/kg)

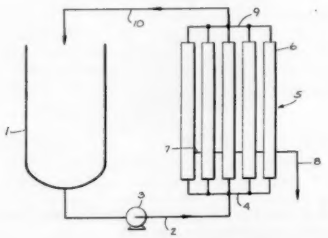
anhydride and chromate and baking the thus applied coating solution at a temperature above 350°C.

3,856,569

PROCESS FOR THE PURIFICATION AND CONCENTRATION OF SOLUTIONS DERIVED FROM MARINE ALGAE

Clifford H. G. Strong, Guelph, Ontario, Canada, assignor to Uniroyal, Ltd., Montreal, Canada

Filed Sept. 7, 1972, Ser. No. 287,178
Claims priority, application Canada, Aug. 16, 1972, 149534
Int. Cl. B01d *13/00;* **C07c** *47/18*
U.S. Cl. 127—34 **20 Claims**



1. The method of purifying and concentrating an aqueous polysaccharide solution derived from marine algae which comprises subjecting said solution to ultrafiltration using a semi-permeable ultrafiltration membrane having an apparent pore diameter of from 20 Angstrom units to 400 Angstrom units and thereby causing water and low molecular weight species to pass through said membrane and the polysaccharide to be retained by said membrane.

3,856,570

METHOD AND APPARATUS FOR CLEANING THE INTERIOR OF INDUSTRIAL VESSELS BY USING ROTATING NOZZLE HEADS

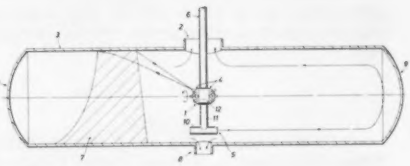
David C. McDermott, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 11, 1972, Ser. No. 296,714
Int. Cl. B08b *9/08*
U.S. Cl. 134—24 **7 Claims**

1. A method for cleaning the interior of a tank car comprising:

inserting within the tank car interior a nozzle assembly including a pair of rotatable nozzle heads for producing high velocity liquid jets of cleaning fluid and a tee-shaped gas nozzle, the liquid nozzle heads and the gas nozzle being mounted on concentric supply pipes which supply liquid to the rotatable nozzles and gas to the gas nozzle, the liquid nozzle heads generally coinciding with the tank axis, and the gas nozzle being parallel to the tank car axis just above the floor of the tank car;

rotating the liquid nozzle heads at least about 10 rpm for producing liquid jets about an axis generally coinciding with the tank axis so as to obliquely sweep a circumferential area approximately 3 feet long of the tank car wall with each nozzle so that each part of the tank wall receives a sweeping action of fresh cleaning fluid several



times each minute continuously removing the liquid from a bottom outlet of the tank car; and

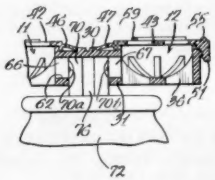
establishing a gas flow pattern from the tee-shaped gas nozzle which extends the length of the tank car so that gas is deflected by each head of the tank car and returned via the upper portion of the tank car to exit via a manway, the gas nozzle comprising a cylindrical head having opposing nozzles with exit diameters not more than about 4 inches and the length of each half of the head being a minimum of about two diameters of the head in order to effectively direct the gas jets issuing from the nozzles.

3,856,571

CONTACT LENS HOLDER AND STORAGE CONTAINER USEFUL IN A METHOD FOR CLEANING CONTACT LENSES

Guy J. Sherman, 504 Burning Tree Ln., Naperville, Ill. 60540

Filed Jan. 22, 1973, Ser. No. 325,254
Int. Cl. A45c *11/04;* **B08b** *3/02*
U.S. Cl. 134—34 **10 Claims**



1. A method of treating a pair of lenses including the steps of: holding the lenses in juxtaposed spaced relationship at the outer ends of oppositely directed passages; providing a container of pressurized lens treating solution provided with nozzle means having oppositely directly spray outlets; disposing said nozzle between the inner ends of said passages; and manipulating the nozzle means to concurrently spray treating solution through said passages for concurrently treating both lenses with said treating solution.

3,856,572

APPARATUS FOR CLEANING UTENSILS OR THE LIKE

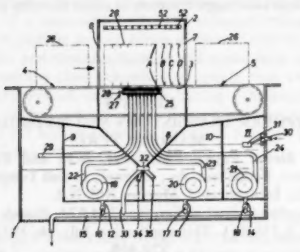
Eduard Hildebrand, Aadorf, Switzerland, assignor to Ed. Hildebrand Ing. AG, Aadorf, Switzerland

Filed Jan. 26, 1973, Ser. No. 327,162

Claims priority, application Switzerland, Jan. 27, 1972, 1202/72

Int. Cl. B08b 3/02

U.S. Cl. 134—96 4 Claims



1. An apparatus for cleaning articles, such as utensils or the like, especially laboratory utensils, said apparatus comprising:

at least one rack for receiving articles to be cleaned,

a nozzle system for delivering different treatment liquids for the treatment of the articles,

separate conduits for the infeed of the different treatment liquids, said separate conduits having respective outlets,

means for successively connecting said nozzle system with said separate conduits,

wherein said nozzle system comprises a conduit system arranged at the rack and spray nozzles supplied by said conduit system,

means defining a cleaning compartment,

a conveyor mechanism for stepwise moving the rack through the cleaning compartment, and

an inlet for said conduit system arranged at the rack such that during the conveying movement of the rack said inlet is successively connected in flow communication with respective outlets of the separate conduits,

wherein the outlets of the separate conduits, viewed in the direction of movement of the conveyor mechanism, are arranged in a row behind one another at a first stationary coupling portion, and the inlet for the conduit system is arranged at a second coupling portion fixedly mounted at an associated movable rack such that said second coupling portion is capable of being brought into operable engagement with the first coupling portion and is displacable relative thereto in order to successively flow communicate the inlet with one of the outlets at the first coupling portion.

3,856,573

METHOD OF PRODUCING A STRUCTURAL MEMBER FORMED OF ELECTRODES, COVER LAYERS AND A SUPPORT FRAME FOR FUEL ELEMENTS WITH A LIQUID ELECTROLYTE, AND STRUCTURAL MEMBER PRODUCED BY THE METHOD

Dieter Groppel, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

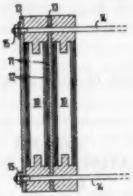
Continuation of Ser. No. 50,051, June 29, 1970, abandoned. This application Aug. 16, 1972, Ser. No. 281,163

Claims priority, application Germany, July 1, 1969, 1933305

Int. Cl. H01m 27/00, 37/00, 27/02

U.S. Cl. 136—86 R 9 Claims

1. Method of producing a compact, storable structure member, formed of catalyst-layer electrodes, cover layers and framework for fuel elements which comprises welding a first metal screen member to one side of a framework portion of reduced thickness projecting from a framework formed of plastic material and forming a first shoulder having a greater length at the outer edge of the framework than the thickness of said first metal screen member, placing at least one screen of plastic material adjacent the first metal screen member, welding a second metal screen member to the other side of the framework portion, which forms a second shoulder located on the opposite side of said framework portion from said first shoulder thereof and having a greater length at the outer edge of the framework than the thickness of said second metal



screen member, so as to sandwich the screen of plastic material between the first and the second metal screen members, spraying on the metal screen members at least one cover layer of fine-granular ion exchanger material suspended in a mixture of a solution of a binding agent and a solvent of the plastic material of the framework, thereafter applying to the ion exchanger cover layer at least one electrode-forming layer of a catalyst suspended in a solution of a binding agent, and drying the layers so as to bond the catalyst layer to the ion exchange cover layer.

3,856,574

ELECTRODE AND METHOD OF MANUFACTURE

Yasuo Amagi, and Zenya Skiiki, both of Tokyo, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Toyko, Japan

Filed Feb. 2, 1972, Ser. No. 223,026

Claims priority, application Japan, Feb. 3, 1971, 46-3776

Int. Cl. H01m 13/00

U.S. Cl. 136—120 FC 3 Claims

1. A porous carbon electrode having an average pore diameter of 0.5 to 20μ, a porosity of 5 to 50%, a bulk density of 0.2 to 0.9 g/cc, a surface-to-weight ratio of 600 to 2,000 m^2/g and a compressive strength of 20 to 400 kg/cm^2, said electrode comprising hollow carbon micro-spheres dispersed in a carbonized matrix wherein said hollow carbon micro-spheres have grain diameters of 5 to 100μ and wall thicknesses of 0.5 to 25μ.

3,856,575

ELECTRIC CELL WITH WIDE AND NARROW POSITIVE AND NEGATIVE PLATES AND PLATE STRAP ATTACHMENT

Herbert Denis Hughes, Evesham, England, assignor to Alkaline Batteries Limited, Redditch, Worcestershire, England

Filed Apr. 2, 1973, Ser. No. 346,804

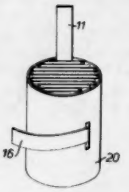
Claims priority, application Great Britain, Apr. 6, 1972, 15971/72

Int. Cl. H01m 37/00

U.S. Cl. 136—134 5 Claims

1. An electric cell of alkaline type having substantially planar rectangular positive and negative plates of pocket type interleaved in a cylindrical casing and lying in planes parallel to the axis of the casing, the outer plates being narrower than the middle ones, in which the plates of each polarity are provided with a plate strap of foil strip, one said plate strap passing circumferentially around and being welded to corresponding longitudinal edges of plates of one polarity, and said other

plate strap passing similarly around and being welded to corresponding longitudinal edges of the plates of the other polarity,



to connect the plates of each polarity together and to an external terminal.

3,856,576

PROCESS OF TREATING ELECTROLYTIC MANGANESE DIOXIDE

Martin Angel Prieto, Diamond Bar, Calif., assignor to Kerr-McGee Chemical Corp., Oklahoma City, Okla.

Filed June 25, 1973, Ser. No. 373,431
Int. Cl. C01g *45/02*
U.S. Cl. 136—139 **10 Claims**

1. A method of treating electrodeposited manganese dioxide comprising:

a. providing an admixture comprising manganese dioxide in an aqueous treatment solution of sulfuric acid and manganous ion, said manganous ion being present in an amount of at least 1 gram per liter of solution, said sulfuric acid being present in an amount sufficient to provide a ratio of manganous ion to sulfuric acid of from 1:10 to 2:1 and said manganese dioxide being present in an amount of from about 150–1,500 gram per liter of solution;

b. maintaining said admixture at a treatment temperature of from about 70°C. to about the boiling point of the admixture for a time of from 2 to 10 hours;

c. agitating said admixture during at least a portion of the time it is maintained at said treatment temperature; and

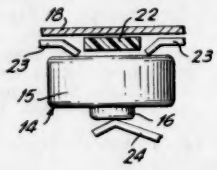
d. recovering the treated manganese dioxide.

3,856,577

ELECTROCHEMICAL CELL SUPPORT AND CONTACT STRUCTURE

Toshihiko Oki, Suwa; Hirohisa Kurita, Shimosuwa, and Motoyuki Fujimori, Suwa, all of Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed July 21, 1972, Ser. No. 274,115
Claims priority, application Japan, July 22, 1971, 46-54859
Int. Cl. H01m *1/04*
U.S. Cl. 136—171 **2 Claims**



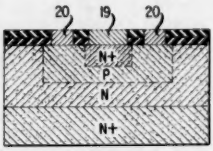
1. In a cell-powered device wherein a cell must be held in a single specific electric orientation for proper operation of said device, and one of said cell terminals is a casing having a longitudinal axis and the other of said cell terminals projects from said casing in a direction along said axis and is substantially smaller in diameter than said one terminal and short circuiting between said terminals must be avoided, the improvement comprising support means for said cell, first and second contact means mounted in juxtaposition to said support means, said support means and contact means being constructed and arranged to allow serial electrical engagement between said terminals of said cell and said contact means only when said cell is mounted in said support means in a pre-selected orientation, said support means including an insulator means so positioned as to engage said other terminal and prevent electrical connection between said first contact means and said other terminal in the event that said cell is inserted into said support means in other than the pre-selected direction.

3,856,578

BIPOLAR TRANSISTORS AND METHOD OF MANUFACTURE

Richard Steven Payne, Piscataway, N.J., and Robert John Scavuzzo, Bethlehem, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 234,021, March 13, 1972, Pat. No. 3,756,861. This application July 16, 1973, Ser. No. 379,408
Int. Cl. H01l *7/54*
U.S. Cl. 148—1.5 **6 Claims**



1. A method of fabricating a transistor comprising the steps of:

exposing a semiconductor zone of one conductivity type to a first ion beam of impurities of opposite conductivity type so as to form a first region of impurities of opposite conductivity type therein;

exposing said zone to a second ion beam of impurities of said opposite conductivity type so as to form a second region of impurities of opposite conductivity type therein over the area of the first region with a peak density which is less than the peak density of the first region and which extends deeper into said zone than the peak density of the first region, said first and second regions of impurities overlapping to form a composite region of impurities comprising the base region which is dominated by the impurities of the first region from the surface of the body to a depth less than x_t and which is dominated by the impurities of the second region at a depth greater than x_t and further wherein there exists at least one point of inflection in the impurity profile of the composite region; and, following the formation of said base region, forming an emitter region of impurities of said one conductivity type within the semiconductor zone within the area defined by said base region by exposing said zone to a third ion beam of impurities of said one conductivity type and subsequently heating said zone to diffuse the impurities further into the bulk of the zone and form the emitter-base junction at a depth which is greater than or equal to x_t.

3,856,579

SPUTTERED MAGNETIC MATERIALS COMPRISING RARE-EARTH METALS AND METHOD OF PREPARATION

Richard P. Allen, Richland, and Ronald D. Nelson, Grandview, both of Wash., assignors to Battelle Development Corporation, Columbus, Ohio

Filed Dec. 4, 1972, Ser. No. 311,879
Int. Cl. H01f 1/02
U.S. Cl. 148—103 **24 Claims**

1. A sputtered-deposit of a magnetic material consisting essentially of a rare-earth metal (R) selected from the class consisting of yttrium and elements of atomic number of 57 to 71, inclusive, and mixtures thereof, and a transition metal (M) selected from the class consisting of cobalt, iron and nickel, and mixtures thereof, said deposit having a thickness greater than 0.001 inch and having been formed at a deposition rate in excess of 0.5 mil per hour, said material having a grain size less than 10 microns.

3,856,580

AIR-STABLE MAGNETIC MATERIALS AND METHOD

John G. Smeggil, Elnora, and Richard J. Charles, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed June 22, 1973, Ser. No. 372,691
Int. Cl. H01f 1/02
U.S. Cl. 148—105 **3 Claims**

1. A process for coating a metal having a melting point above 500°C on cobalt-rare earth alloy particles without significantly deteriorating their permanent magnet properties producing magnetically air-stable particles which comprises providing particles of cobalt-rare earth alloy having an average size up to about 10 microns, providing an organometallic compound which at a temperature below 500°C decomposes and yields products of decomposition consisting of gaseous non-metallic product and a metal vapor, placing said compound and said particles in a substantially inert atmosphere which is a flowing atmosphere or a substantial vacuum, heating said organometallic compound at a temperature below 500°C and substantially completely decomposing it and producing said gaseous product of decomposition and a metal vapor, contacting the resulting metal vapor with the cobalt-rare earth alloy particles depositing a coherent substantially uniform metal coating which at least envelops the particles providing an effective barrier to the atmosphere and which has no significant deteriorating effect on their magnetic properties and diffusing away the non-metallic gaseous products of decomposition, said organometallic compound being used in an amount which on decomposition yields a partial pressure of metal vapor of at least about 10^{-7} atmosphere and produces the metal in an amount ranging from 1 percent to 5 percent by weight of said cobalt-rare earth alloy particles and said deposited metal having a melting point above 500°C.

3,856,581

ANNEALING AIR-STABLE MAGNETIC MATERIALS HAVING SUPERIOR MAGNETIC CHARACTERISTICS AND METHOD

John G. Smeggil, Elnora, and Richard J. Charles, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed June 22, 1973, Ser. No. 372,688
Int. Cl. H01f 1/02
U.S. Cl. 148—105 **3 Claims**

1. A process for increasing the intrinsic coercive force of magnetically air-stable cobalt-rare earth alloy particles coated with a metal having a melting point above 500°C which comprises annealing the coated particles in an inert atmosphere or in a substantial vacuum or in air at a temperature ranging from about 50° to 200°C for a period of time ranging from 30 minutes to 100 hours, said annealing increasing the intrinsic coercive force of said coated cobalt-rare earth alloy particles by at least 10 percent, said magnetically air-stable particles having been produced by providing particles of cobalt-rare earth alloy having an average size up to about 10 microns, providing an organometallic compound which at a temperature below 500°C decomposes and yields products of decomposition consisting of gaseous non-metallic product and a metal vapor, placing said compound and said particles in a substantially inert atmosphere which is a flowing atmosphere or a substantial vacuum, heating said organometallic compound at a temperature below 500°C and substantially completely decomposing it and producing said gaseous product of decomposition and a metal vapor, contacting the resulting metal vapor with the cobalt-rare earth alloy particles depositing a coherent substantially uniform metal coating which at least envelops the particles providing an effective barrier to the atmosphere and which has no significant deteriorating effect on their magnetic properties and diffusing away the non-metallic gaseous product of decomposition, said organometallic compound being used in an amount which on decomposition yields a partial pressure of metal vapor of at least about 10^{-7} atmosphere and produces the metal in an amount ranging from 1 percent to 5 percent by weight of said cobalt-rare earth alloy particles and said deposited metal having a melting point above 500°C.

3,856,582

FABRICATION OF MATRIX BONDED TRANSITION METAL-RARE EARTH ALLOY MAGNETS

John G. Smeggil, Elnora, and Richard J. Charles, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed June 22, 1973, Ser. No. 372,690
Int. Cl. H01f 1/02
U.S. Cl. 148—105 **4 Claims**

1. A process for depositing a substantially interconnecting adherent coating of a metal having a melting point above 500°C on the exposed surfaces of pressed particles of cobalt-rare earth alloy without significantly deteriorating their permanent magnet properties producing a magnetically air-stable compact which comprises providing particles of cobalt-rare earth alloy having an average size up to about 10 microns, providing an organometallic compound which is a solid or liquid at room temperature and which at a temperature below 500°C decomposes and yields products of decomposition consisting of gaseous non-metallic product and a metal vapor, admixing said organometallic compound and said particles of alloy to form a substantially intimate mixture, said organometallic compound being used in an amount which on decomposition produces the metal in an amount ranging from 1 percent to 5 percent by weight of said cobalt-rare earth alloy particles, pressing said mixture to form a green body, heating said green body in a substantially inert atmosphere which is a flowing atmosphere or a substantial vacuum at a temperature below 500°C and substantially completely decomposing said organometallic compound and producing said gaseous product of decomposition and metal vapor, said metal vapor depositing a substantially interconnecting continuous coating of metal having a melting point above 500°C on the exposed surfaces of said pressed particles substantially uniformly throughout said body and having no significant deteriorating effect on the magnetic properties of said alloy particles, said deposited metal supporting said particles and providing the resulting compact with an effective barrier to the atmosphere, said non-metallic gaseous product of decomposition diffusing away from said body leaving the resulting compact porous in an amount ranging from about 5 to 40 percent by volume of said compact.

3,856,583

METHOD OF INCREASING HARDNESS OF ALUMINUM-SILICON COMPOSITE

Robert N. Sanders, Baton Rouge, L:., and Alex R. Valdo, Elgin, Ill., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 219,523, Jan. 20, 1972, abandoned. This application July 9, 1973, Ser. No. 377,724

Int. Cl. C22f 1/04; C22c 21/04

U.S. Cl. 148—159 2 Claims

1. A method of increasing the hardness of an aluminum-silicon composite, said composite consisting essentially of an aluminum, silicon, magnesium alloy and a non-metal filler not subject to being reduced by aluminum selected from the group consisting of zircon, alumina, zirconia and aluminum silicates, said silicon being present in said alloy in an amount of 19–21 percent by weight said magnesium being present in said alloy in an amount of about 2 to 10 percent by weight sufficient to reduce the surfaces of the non-metallic filler to a metal-like coating when the metallic phase of the composite is in a liquid state, said non-metal filler constituting from about 5 to about 80 percent of the weight of the composite, consisting essentially of subjecting said composite to a threestage heat treatment as follows:

a. conducting a solution heat treatment at 800°–1,000°F for about 4 to 24 hours followed by a quench;

b. conducting a precipitation heat treatment at 200°–300°F for about 12 to 36 hours; and,

c. conducting a second precipitation heat treatment at 300°–400°F for about 4 to 12 hours.

3,856,584

REDUCING THE SUSCEPTIBILITY OF ALLOYS, PARTICULARLY ALUMINIUM ALLOYS, TO STRESS CORROSION CRACKING

Baruch M. Cina, Ramat Gan, Israel, assignor to Israel Aircraft Industries Ltd., Lod Airport, Israel

Filed Mar. 13, 1973, Ser. No. 340,757

Claims priority, application Israel, Apr. 12, 1972, 39200

Int. Cl. C22f 1/04

U.S. Cl. 148—159 2 Claims

1. A method of substantially reducing the susceptibility to stress-corrosion cracking of the 7,000 series aluminum alloys containing zinc, magnesium, and copper, while still retaining their original mechanical strength, which alloys have been subjected to a solution heat treatment at a high temperature and then to an aging treatment at a lower temperature thereby hardening the alloy but likewise producing therein a susceptibility to stress-corrosion cracking, comprising the steps of:

a. subjecting the alloy to a retrogression heat treatment for a few seconds to a few minutes at a temperature of from 200°C to 260°C, which temperature is above the age-hardening temperature of the alloy but below the solution heat treatment temperature; and

b. subsequently subjecting the alloy to a re-aging heat treatment at a temperature from 115°C to 125°C for a substantially longer period of time than in step (a) up to several days.

3,856,585

METHOD AND APPARATUS FOR THERMALLY DECOMPOSING A HALOGENATED HYDROCARBON TO PROVIDE A GASEOUS CARRIER MEDIUM FOR VAPOR EPITAXIAL GROWTH

Ronald L. Moon, Palo Alto, Calif.; William W. Stein, Fort Wayne, Ind., and Donald Warnock, Aromas, Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Aug. 4, 1972, Ser. No. 277,965

Int. Cl. H01l 7/36; C01b 7/08

U.S. Cl. 148—175 9 Claims

1. A method of forming a hydrogen halide gas during vapor phase epitaxial growth of a compound crystal having at least one higher valence constituent and at least one lower valence constituent on the growing surface of a substrate, by incorporating a source material of the constituents in a carrier gas flow containing the hydrogen halide, the method comprising the steps:

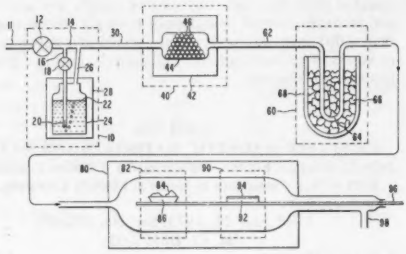
storing an inert, non-toxic halogenated hydrocarbon;

providing a gas flow containing the halogenated hydrocarbon;

completely decomposing the halogenated hydrocarbon into carbon and a hydrogen halide;

removing the carbon from the gas flow;

exposing the source material to the gas flow containing the hydrogen halide at a first temperature sufficient to cause



a chemical reaction between the hydrogen halide and the source material which produces a gaseous halide of the at least one lower valence constituent and a gaseous species of the at least one higher valence constituent; and

exposing the substrate to the gas flow containing the source material in gaseous form at a second temperature lower than the first temperature causing the halide of the at least one lower valence constituent and the gaseous species of the at least one higher valence constituent to decompose permitting the constituents to expitaxially deposit on the growing surface of the substrate.

3,856,586

METHOD FOR PRODUCING HOMOGENEOUSLY DOPED ZONES IN SEMICONDUCTOR DEVICES

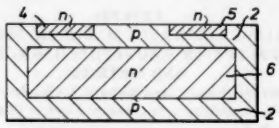
Edgar Borchert, and Karl-Heinz Sommer, both of Belecke, Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Germany

Filed Sept. 10, 1973, Ser. No. 395,455

Claims priority, application Germany, Sept. 14, 1972, 2244992

Int. Cl. H01l 7/44

U.S. Cl. 148—186 19 Claims

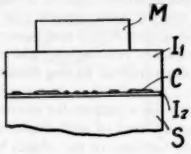


1. A method for producing a semiconductor device in a semiconductor wafer which is initially substantially undoped, comprising the steps of: forming in outer areas of the semiconductor wafer the semiconductor zones necessary for creating the device while leaving an interior zone of the semiconductor wafer substantially undoped; and subsequently doping the semiconductor wafer with a doping material which is only slightly soluble in the material of the semiconductor wafer and has a high diffusion speed, for substantially homogeneously doping the interior zone.

3,856,587
METHOD OF FABRICATING SEMICONDUCTOR MEMORY DEVICE GATE

Shumpei Yamazaki, c/o Yamazaki Kogyo K.K.9-7,1-chome Shinkawa, Shizuoka; Ichiro Kagawa, c/o Tokyo Denki Kagaku Kogyo K.K.15-7,2-chome Higashi Ohwada, Tchikawa, and Yuriko Sugimura, c/o Yamazaki Kogyo K.K.9-7,1-chome Shinkawa, Shizuoka, all of Japan

Filed Mar. 20, 1972, Ser. No. 236,153
Int. Cl. H01l *7/36*
U.S. Cl. 148—187 **18 Claims**

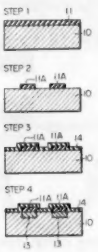


1. The method of fabricating the gate of a semiconductor memory device, which comprises depositing a thin insulating coating in at least a mono-layer on a surface of a semiconductor substrate, forming a semiconductor cluster or a thin film made of silicon or germanium on the thin insulating coating, and forming a silicon nitride coating on the top of the cluster or thin film, thereby forming memory capability controlling the existence, polarity and amount of charge to be trapped into the insulating coating.

3,856,588
STABILIZING INSULATION FOR DIFFUSED GROUP III-DEVICES

Masafumi Hashimoto, and Yasuo Shimura, both of Kawasaki, Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Oct. 10, 1973, Ser. No. 405,096
Claims priority, application Japan, Oct. 11, 1972, 47-102123; Oct. 11, 1972, 47-102124; Oct. 11, 1972, 47-102125
Int. Cl. H01l *7/34*
U.S. Cl. 148—188 **7 Claims**



1. A method of forming diffused junctions in a III–V compound semiconductor wafer, comprising the steps of:

forming a first oxide layer containing an impurity element to be diffused on selected areas of a surface of said wafer leaving remaining areas of said surface exposed;

forming a second oxide layer containing a Group III metal over said first oxide layer and exposed said remaining areas of said surface of said wafer, said metal being a constituent of said wafer; and

heating said wafer to diffuse said impurity element into said wafer.

3,856,589
FLUORINE-CONTAINING ORGANIC CARBONATE

Albert L. Rocklin, Walnut Creek, Calif., assignor to Shell Oil Company, New York, N.Y.

Filed Oct. 12, 1970, Ser. No. 81,634
Int. Cl. C06b *15/00;* **C07c** *69/00*
U.S. Cl. 149—109.4 **3 Claims**

1. Di[2,3-bis(difluoramino)propyl] carbonate of refractive index, n^{25}_D, of up to 1.3990 and impact sensitivity of from about 20 to 22 kg-cm.

3,856,590
PROPELLANTS AND METHOD OF PRODUCING THE SAME

John F. Kincaid, Jefferson Township; Louis P. Hammett, Pittsburgh, both of Pa., and Benjamin P. Dailey, Cumberland, Md., assignors to The United States of America as represented by the Director, Office of Scientific Research and Development, Washington, D.C.

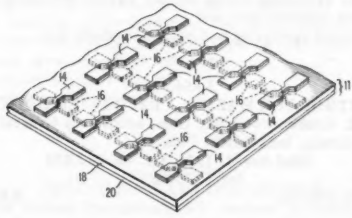
Filed Apr. 18, 1945, Ser. No. 589,090
Int. Cl. C06d *5/06*
U.S. Cl. 149—19.8 **1 Claim**

1. A new article of manufacture, a propellant comprising about 21.0 percent nitrocellulose, about 13.0 percent nitroglycerine, about 55.4 percent potassium perchlorate of an average particle diameter of 7.5 ± 0.5 mu, about 9.0 percent carbon black, about 1.0 percent centralite No. 1, 0.3 percent magnesium oxide and 0.3 percent magnesium stearate, the nitrocellulose and nitroglycerine being colloided and intimately mixed with the other ingredients to form a matrix in which the particles of potassium perchlorate and carbon black are distributed.

3,856,591
METHOD FOR MAKING BEAM LEAD DEVICE

Louis Sebastian Napoli, Hamilton Square, and John Joseph Hughes, Spotswood, both of N.J., assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 314,089, Dec. 11, 1972, abandoned. This application June 25, 1973, Ser. No. 373,600
Int. Cl. H01l *7/50*
U.S. Cl. 156—3 **6 Claims**



1. The method of making a semiconductor device comprising the steps of:

a. providing an appropriately doped piece of semiconductor material having a first side and a second side;

b. depositing a first set of elongated metal contacts upon said first side of said semiconductor material;

c. depositing a second set of elongated metal contacts upon said second side of said semiconductor material, said second set of elongated metal contacts crossing said first set of elongated metal contacts; and

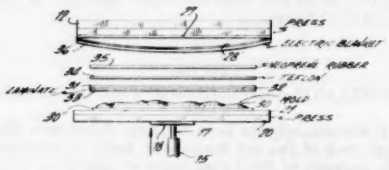
d. etching said semiconductor material thereby removing all of said semiconductor material other than that which is disposed between said first set and said second set of elongated metal contacts.

3,856,592

METHOD OF MAKING AN EMBOSSED TRIDEMENSIONAL PHOTOGRAPH BY A DRY PROCESS

Lewis A. Giorgi, 286 Main St., Yonkers, N.Y. 10701

Filed Nov. 30, 1972, Ser. No. 310,699
Int. Cl. B44f 7/00; B28G 11/08; B32b 3/00; B44c 1/24
U.S. Cl. 156—59 5 Claims



1. A dry method of producing an embossed photograph of life-like appearance which comprises introducing a pre-heated laminate having as its top layer a dry photograph of a subject on a canvas layer with a plastic lowermost layer into a pre-heated hydraulic press on supported contoured hardenable molding material conforming to the subject of the photograph and shaping the laminate to conform to the contoured molding material by actuation of the press, and thereafter removing the contoured laminate and finishing the same into the desired embossed photograph.

3,856,593

EXPANDED POROUS SUBSTRATE FOR FIBROUS GRAPHITE STRUCTURE

Ronald L. Pegg, Costa Mesa, Calif., assignor to Haveg Industries, Inc., Wilmington, Del.

Filed May 23, 1972, Ser. No. 256,070
Int. Cl. B29c 25/00
U.S. Cl. 156—60 11 Claims

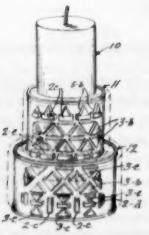
1. A process for making a porous substrate unit comprising:
1. providing a substrate unit comprising plies of B-stage graphitizable resin impregnated cloth having a carbon assay of at least 80 percent;
2. heating said substrate unit in the absence of external pressure to convert said resin to C-stage, said substrate unit expanding during heating thereby producing a porous substrate unit; and
3. at least pyrolyzing said porous substrate unit.

3,856,594

METHOD FOR MAKING A DECORATED OBJECT

John R. Grube, Waterville, Ohio, assignor to General Mills Fun Group, Inc., Toledo, Ohio

Filed Nov. 1, 1973, Ser. No. 412,002
Int. Cl. B44l 5/00
U.S. Cl. 156—63 6 Claims



1. A method for making a decorated object, said method comprising the steps of:

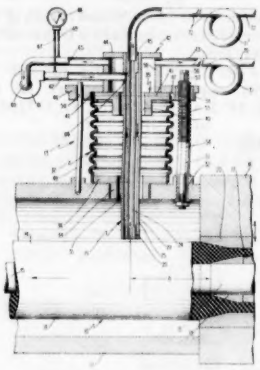
A. cutting from large slabs of splittable grain lumber a plurality of pieces of predetermined standard thickness and unit width,
1. some of said pieces being rectangular and having a length which is a multiple of said unit width,
2. the grain of all of said pieces extending in the direction of such standard thickness;
B. placing said rectangular pieces one after another between parallel guides that are spaced a distance equal to such unit width and that have a cross guide for a splitting device and a stop spaced from said cross guide a distance equal to such unit width;
C. splitting a predetermined number of said pieces with the grain thereof to form unit-squares,
D. splitting selected ones of said unit-squares to form shapes consisting of squares, rectangles, right triangles, isosceles triangles and diamonds all having dimensions along their sides equal to a unit distance or a fraction of a unit distance as desired for a pattern for decoration and,
E. adhering selected ones of said shapes in patterned relationships to the surfaces of the object being decorated.

3,856,595

MEASUREMENT OF DIMENSION OF ELONGATED MATERIAL DURING ITS CONTINUOUS VULCANIZATION

Max Skobel, Iselin, N.J., assignor to John Royle & Sons, Paterson, N.J.

Filed Apr. 16, 1973, Ser. No. 351,592
Int. Cl. G01b 13/08
U.S. Cl. 156—64 18 Claims



1. The method of detecting radial deviations in position of the surface of an elongated vulcanizable material of generally uniform transverse section travelling in a predetermined path through a continuous vulcanizing chamber wherein it is exposed to a fluid vulcanizing atmosphere at elevated pressure and temperature, the vulcanizable material being a sleevelike extruded sheath on a cable having a central, axially directed core, comprising directing a jet of fluid at a pressure above said elevated pressure through one end of a probe against a zone of the surface of the material as it travels within the chamber, axially guiding the core of the cable along a fixed path at a location close to the location of the jet, and detecting, by indicating means connected to the opposite end of the probe, deviations in the fluid from the jet which is reflected from said zone of the surface of the travelling material.

3,856,596

BACKED TUFTED CARPET AND METHOD OF MANUFACTURING THE SAME

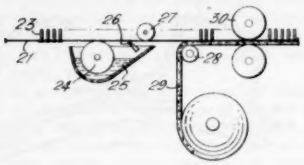
Stanley Shorrock, "The Braids," Billinge End Rd., Blackburn, England

Filed Dec. 21, 1971, Ser. No. 210,507

Claims priority, application Great Britain, Dec. 31, 1970, 62094/70

Int. Cl. D05c *15/00*

U.S. Cl. 156—72 **8 Claims**



1. A method of manufacturing a tufted carpet comprising the steps of traversing a backing fabric which has a front and a back past a row of tufting needles, causing said needles to insert straight tufts of pile yarn through said backing fabric with each tuft having a relatively long, pile end projecting forwardly from the front of the backing fabric and an opposed relatively short fixing end projecting from the back of the fabric, applying an adhesive to said short ends of said tufts at the back of the fabric to secure them in said fabric, separately producing a layer of resilient foamed rubber, sticking said layer to said back of said backing fabric and said short ends of said tufts by means of an adhesive, and splaying said short ends apart and situating them in flattened condition against the back of the fabric, said splaying and flattening of said short ends being carried out at a time no later than the sticking of said layer to said back of said backing fabric.

3,856,597

METHOD AND APPARATUS FOR PRODUCING PILE FABRIC

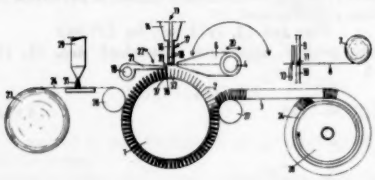
Clemens Adrianus Maria Campman, Leeuweriklaan 23, Bussum, Netherlands

Filed Apr. 24, 1973, Ser. No. 353,968

Claims priority, application Netherlands, Apr. 27, 1972, 7205734

Int. Cl. B32b *3/16, 5/08*

U.S. Cl. 156—72 **6 Claims**



1. Apparatus for use in producing a pile fabric wherein the pile has a predetermined height comprising

a roller rotated intermittently and having a plurality of peripherally located, spaced radially extending slats;

yarn supply means;

cutting means associated with said yarn supply means to cut off pieces of yarn, the length of each piece being equal to twice the pile height;

pivotal means capable of grasping the individual cut yarns and transporting said yarns by pivotal movement to said slats;

reciprocating means located adjacent said roller;

a receiving area located between said reciprocating means and said slats, said yarn pieces being transported to said receiving area by said pivotal means;

said reciprocating means having leg means movable into said receiving area to fold center portions of individual yarn pieces respectively about ends of succeeding slats during a stationary part of said intermittent rotation;

movable holding means located adjacent said receiving area and adapted to contact the individual ends of said slats over which said individual yarn pieces have been folded, said contact taking place when said roller is stationary, and said holding means being mounted to be movable out of contact therewith when said roller is subjected to said intermittent rotation; and

carpet backing means located adjacent said roller and adapted to feed backing material into adhering association with said folded yarn pieces.

3,856,598

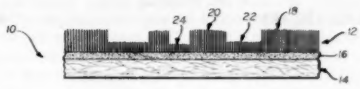
PROCESS FOR TREATING FABRICS

Razmic S. Gregorian, Aiken, S.C., and Hans R. Hoerale, Augusta, Ga., assignors to United Merchants and Manufacturing, Inc., New York, N.Y.

Filed Sept. 24, 1971, Ser. No. 183,371

Int. Cl. B29c *27/00;* **B32b** *31/00;* **D03d** *27/00;* **D04h** *11/00*

U.S. Cl. 156—85 **9 Claims**



1. A method for producing three dimensional and variable color effects in a laminate of the the type composed of a backing layer, a facing layer of upstanding fibers, and a water insoluble, substantially continuous binder inter-layer, securing the facing layer to the backing layer, consisting of:

a. shrinking selected areas of the facing layer in a predetermined design pattern by applying a chemical shrinkage agent to said selected areas;

b. drying the laminate; and

c. washing the laminate.

3,856,599

SEALED EDGE CUTTING METHOD

Don M. Bylund, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

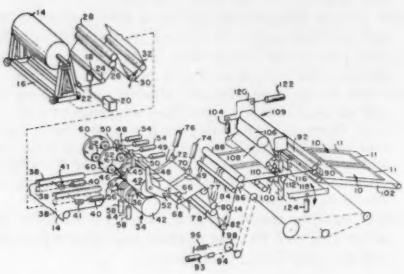
Continuation of Ser. No. 834,641, June 19, 1969, abandoned. This application Aug. 23, 1973, Ser. No. 390,986

Int. Cl. D03d *47/50;* **B32b** *31/08*

U.S. Cl. 156—88 **7 Claims**

1. A method to produce a sealed edge product comprising the steps of: providing a supply of textile material, putting a pre-selected length of material under tension in a predetermined fixed position, placing a thermoplastic strip of material across the width of said textile material, applying heat and pressure to said thermoplastic strip of material to seal said thermoplastic strip to said textile material, moving a cutting means into registry with said thermoplastic seal while holding said textile material in said pre-determined fixed position, actuating said cutting means to sever said textile material through said thermoplastic seal, moving the severed textile material to a point of collection while putting another length

of textile material in said pre-determined position under tension and successively repeating the steps to provide successive



textile material segments with the edges sealed across the width thereof.

3,856,600

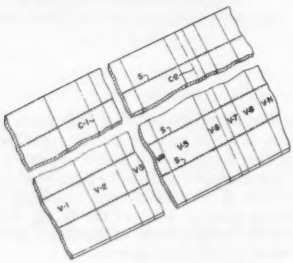
VENEER ARTICLE AND PROCESS OF MANUFACTURING PLYWOOD

Fred W. Fields, Portland, Oreg., assignor to The Coe Manufacturing Company, Plainesville, Ohio

Continuation-in-part of Ser. No. 118,850, Feb. 25, 1971, abandoned. This application Dec. 7, 1972, Ser. No. 312,919

Int. Cl. B32g *7/08*

U.S. Cl. 156—93 **4 Claims**



1. In the manufacture of rectangular plywood panels having length, width and thickness dimensions the steps of producing a plurality of green veneer sheets slightly longer than one of the dimensions other than the thickness dimension of a plywood panel to be produced and of random width less than the other dimension of the panel and with the grain of the wood running lengthwise of the green veneer sheets, arranging a plurality of the green veneer sheets in side-by-side relation, machine sewing the side-by-side green veneer sheets transversely of the grain of the wood and of the length of the green veneer sheets intermediate their ends with thread to produce a plurality of continuous rows of thread stitches connecting the side-by-side green veneer sheets to produce an assemblage of side-by-side green veneer sheets larger in length and width than the length and width of the panel to be produced, drying the assemblage of stitched together side-by-side green veneer sheets to reduce the moisture content of the veneer and produce an assemblage of connected side-by-side dried veneer sheets, applying adhesive material to the assemblage of connected side-by-side dried veneer sheets, and subsequently assembling the assemblage of connected side-by-side dried veneer sheets having adhesive thereon with other dried veneer sheets into a plywood panel.

3,856,601

METHOD OF RETREADING VEHICLE TIRES

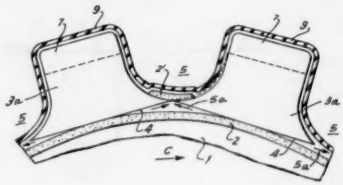
Wilhelm Schelkmann, Crengeldanzstr. 85, Witten, Germany

Division of Ser. No. 58,107, June 24, 1970, Pat. No. 3,745,084. This application Apr. 3, 1973, Ser. No. 347,614

Claims priority, application Germany, Nov. 10, 1969, 1956391

Int. Cl. B29h *5/04, 5/16, 17/36*

U.S. Cl. 156—96 **7 Claims**



1. In a method of retreading vehicle tires, the first step of forming an assembly consisting essentially of a tire carcass having a circumferential face, tread means of elastomeric material superimposed upon said circumferential face and provided with relatively deep spaced profiles, and a bonding material between said carcass and said tread means; the second step of confining said assembly in a fluid-tight flexible envelope which overlies said profiles in close abutment with the edges of said profile; the third step of establishing a pressure drop in direction from the exterior to the interior of said envelope so that the same is displaced into the recesses between respective ones of said spaced profiles down to the lowest base regions of the latter so as to exert at such base regions a substantially uniform pressure upon said tread means; the fourth step of venting gaseous fluid entrapped in the respective base region between said profile and said envelope to the exterior of the latter; and the fifth step of vulcanizing said assembly for permanently bonding said tread means to said carcass while said envelope exerts said pressure upon said tread means.

3,856,602

METHOD OF PRODUCING NON-WOVEN TEXTILE FIBER PRODUCTS HAVING A RELIEF-LIKE STRUCTURE

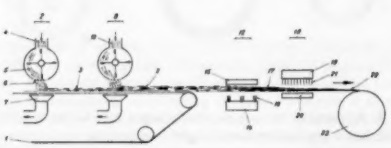
Johannes Jakobus Vincent Colijn, and Gunter Horst Tesch, both of Fribourg, Switzerland, assignors to Breveteam S.A., Fribourg, Switzerland

Filed Jan. 12, 1972, Ser. No. 217,363

Claims priority, application Switzerland, Jan. 12, 1971, 390/71

Int. Cl. B32b *3/00*

U.S. Cl. 156—148 **4 Claims**



1. A method of producing non-woven, textile fiber fabrics with boucle-type knobs or ridges on the fabric surface from at least two kinds of fibers of unequal retractability, comprising the steps of:

superposing in a multi-layer batt at least two distinct layers of fibers, the fibers of one outside layer exhibiting a considerably higher longitudinal retraction than the other

fibers of the batt, when all are subjected to the same retraction-inducing treatment;

pattern-needling the multi-layer batt from the side of the highly retractable fiber layer with punching needles which are aligned to produce a repetitive line pattern so that, in the line-regions of needling, length portions of the fibers of the highly retractable fiber layer are punched transversely through the remainder of the batt and protrude from the other side thereof as bristles or loops;

folding the protruding bristles or loops against the batt side from which they protrude;

needling the entire surface of the batt from the side of the protruding fibers so as to needle-punch the protruding portions of the highly retractable fibers back into the composite batt to form hooks having a shape similar to clinched staples; and

subjecting the composite batt to a retraction treatment, whereby the longitudinal retraction of the retractable fibers not only causes the clinched, twice-needled, staple-shaped fibers to shorten and close upon themselves into tighter hooks, thereby compacting the less retractable fibers in the line regions of pattern needling, but also causes an overall area shrinkage of the needled batt, resulting in a lateral compression and an elevation of the less retractable fibers in the batt areas between the line regions of pattern needling so as to give the fabric the desired boucle-type, three-dimensional surface.

3,856,603

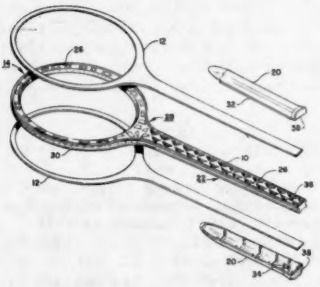
METHOD OF MANUFACTURING GAME RACKETS

William E. Schaefer, and Richard E. Bender, both of San Diego, Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Division of Ser. No. 241,176, April 5, 1972, Pat. No. 3,840,230. This application May 14, 1973, Ser. No. 359,815

Int. Cl. B29g *1/00, 7/00*

U.S. Cl. 156—245 **7 Claims**



1. A method of manufacturing a game racket which comprises the steps of:

molding a racket shell having a head frame and a handle extension connected to the frame by a throat portion, said shell being substantially planar with two substantially parallel faces, from a material comprising a synthetic resin having flexural modulus of from about 3×10^5 to about 17×10^5 psi and a notched Izod impact measurement of from about 2 to 15 ft-lb/in., said shell being formed with a plurality of spaced pockets extending inwardly from the faces;

forming substantially planar facing members having the general shape of said shell from a material comprising high-strength fibers in a synthetic resin matrix, said fibers having a Young's modulus of from about 20×10^6 to about 80×10^6 psi and a density of from about 0.05 to about 0.07 lb/in.^{3};

laminating a facing member to each of said shell faces to cover said inwardly extending pockets; and

securing pallet members to the handle extension of said shell to form an easily gripped handle.

3,856,604

MACHINE FOR SELECTIVELY CUTTING AND GLUING ADDRESS LABELS

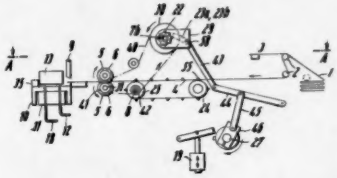
Erkki Lukkarinen, Helsinki, Finland, assignor to Kontorikoneteollisuus Oy, Helsinki, Finland

Filed Sept. 15, 1972, Ser. No. 289,429

Claims priority, application Finland, Sept. 24, 1971, 2680/71

Int. Cl. B65h *35/04*

U.S. Cl. 156—361 **1 Claim**



1. Machine for gluing address labels from address list bands and having feeding elements for moving said address list bands, said bands having transport holes on the lengthwise edges and having addresses printed across the band; said band having two or more lengthwise rows of addresses separated from each other across the band by spaces, and crosswise lines of two or more addresses, said crosswise lines of addresses being separated from each other along the band by spaces, means for cutting off the lengthwise edges after said address list band has moved a selected distance, means for cutting off address line strips after said lengthwise edgings have been cutoff, a track for receiving said line strips and means for detaching separate labels from said address line strips, means for applying glue to the bottom of the detached address label and means for pressing the glued label onto a surface, said feeding elements being mounted on feeding chains which are in turn mounted on a pair of endless tracks in vertical planes along the address list band, said endless tracks being positioned one at each side of said address list band; means for adjusting the length of the cut labels, the length adjusting means comprising a ratchet wheel, a plurality of ratchets of different lengths and means for placing a selected one of said ratchets in contact with said ratchet wheel; means for connecting the endless track for movement with said ratchet wheel, said ratchet wheel and endless track being moveable a selected amount by the one said ratchet to control the length of the label to be cut.

3,856,605

APPARATUS FOR BONDING PILE YARNS ONTO RIGID THERMOPLASTICS

Charles W. Carpenter, Wilmington, Del., assignor to Hercules Incorporation, Wilmington, Del.

Division of Ser. No. 888,708, Dec. 29, 1969, abandoned, which is a continuation-in-part of Ser. No. 780,038, Nov. 29, 1968, Pat. No. 3,640,786, which is a continuation-in-part of Ser. No. 731,221, May 22, 1968, abandoned. This application July 26, 1972, Ser. No. 275,386The portion of the term of this patent subsequent to Feb. 8, 1989, has been disclaimed.

Int. Cl. B32b *31/16*

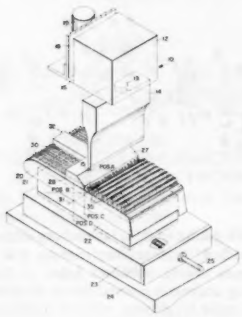
U.S. Cl. 156—436 **5 Claims**

1. Apparatus for covering the surface of a substantially rigid thermoplastic article with tufted thermoplastic yarn which comprises:

support means for supporting and advancing said thermoplastic article,

loop forming means for guiding a plurality of oriented thermoplastic yarns in sheet-like array onto a surface of said thermoplastic article along a bonding line extending transversely of the path of movement of said thermoplastic article and for forming loops therein between the bonding line and the preceding bond between the respective yarns and the thermoplastic article,

a sonic device having a working surface adapted to engage said yarns and thermoplastic article along said bonding line,



means for moving said sonic device into and out of pressure engagement with said yarns and thermoplastic article along the bonding line,

actuating means for energizing said sonic device to sonically fusion bond said yarns to the thermoplastic article during said pressure engagement without adversely affecting the orientation of the yarns between the bonding lines, and

means operative, when the bonding operation is completed for causing said support means to advance a predetermined amount and to cause operation of said loop-forming means whereby loops are formed and properly positioned for subsequent bonding to the thermoplastic article.

3,856,606

COUPLING SOLID SUBSTRATES USING SILYL PEROXIDE COMPOUNDS

You Ling Fan, E. Brunswick, and Richard Greggshaw, Califon, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. Nos. 737,319, June 17, 1968, abandoned, and Ser. No. 831,747, June 9, 1969, abandoned, which is a continuation-in-part of Ser. No. 737,315, June 17, 1968, abandoned, and Ser. No. 737,316, June 17, 1968, abandoned, and Ser. No. 737,317, June 17, 1968, abandoned, and Ser. No. 737,318, June 17, 1968, abandoned, and Ser. No. 737,321, June 17, 1968, abandoned. This application May 5, 1970, Ser. No. 34,897

Int. Cl. C09j *5/00*; B32b *27/04*

U.S. Cl. 156—329 **1 Claim**

1. The method of interbonding solid surfaces which comprises providing a silicon peroxide comprising a peroxide radical bonded to silicon thereof through a peroxy oxygen, at the interface of said surfaces and decomposing such peroxide radical.

3,856,607

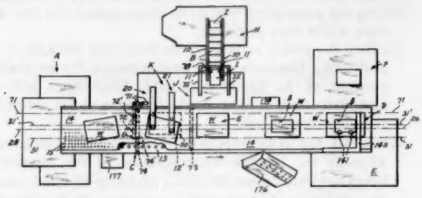
APPARATUS FOR AUTOMATICALLY REGISTERING AND COMBINING TWO SHEET MEMBERS

Maurice J. Faltot, Morris Plains, and Helmut Voltmer, Park Ridge, both of N.J., assignors to NJM, Inc., Hoboken, N.J.

Filed Aug. 14, 1972, Ser. No. 280,673

Int. Cl. B32b *31/00*; G05g *15/00*

U.S. Cl. 156—351 **19 Claims**



1. Apparatus for automatically registering and combining two sheet members, comprising means for carrying a plurality of first sheets having adhesive thereon in spaced apart relation along a given path, means for successively repositioning said first sheets on said carrying means so that a given line extending lengthwise of said path on the sheet shifted is brought into registered alignment with a reference line located to one side of and in spaced parallel relation to the longitudinal centerline of said carrying means, said repositioning means comprising a plurality of sensing means movable transversely of said carrying means and each capable of developing a signal when sensing said given lengthwise line on a first sheet, means for moving said sensing means independently until each has found such given lengthwise line, said sensing means each having associated therewith means for gripping a first sheet at different locations thereof when such given lengthwise line has been found, and means for moving in coactive relation the gripping means associated with the sensing means to shift the gripped sheet until said given lengthwise line thereof is brought into alignment with said reference line, and means for searching in a direction longitudinally of said path for a given line disposed transversely of said path on such repositioned sheet and for depositing on such sheet when found a second sheet so as to bring both of such sheets into adhesive face-to-face relation.

3,856,608

APPARATUS FOK MAKING HEAT-INSULATING PANEL OR SHEET

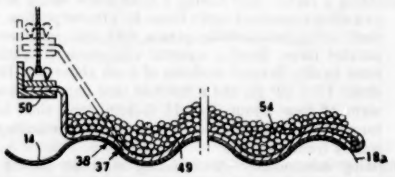
John Ian Menzies, and Maureen Menzies, both of Brisbane, Queensland, Australia, assignors to Heatshield Research and Development Pty. Ltd., Queensland, Australia

Division of Ser. No. 834,241, June 16, 1969, Pat. No. 3,720,558. This application Dec. 21, 1972, Ser. No. 317,250

Claims priority, application Australia, June 17, 1968, 39284/68; July 16, 1968, 40707/68; Aug. 6, 1968, 41754/68

Int. Cl. B31f *1/24*; B32b *31/20*

U.S. Cl. 156—468 **6 Claims**



1. Apparatus for heat insulating a panel or sheet comprising:

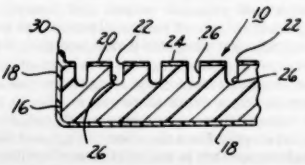
a. a main frame,

b. means for conveying said panel along said main frame,
c. means for simultaneously applying to the upper surface of said moving panel layers of a metal foil and a film of thermoplastic material, with the film being interposed between said panel and said foil so as to maintain said foil continuously out of contact with said panel,
d. a flexible sheet over the entire exposed surface of said foil on said moving panel, said flexible sheet being longitudinally non-movable and assuming the surface configuration of said moving panel and layers,
e. means in the form of a continuous mass of deformable weight on the surface of said flexible sheet for pressure contacting said sheet against said foil thereby firmly pressing the entire surface of said foil and film layers against said panel, and
f. heating means adjacent said flexible sheet for heating said laminated panel to cause said thermoplastic film to adhere both to said foil and to said surface of said panel thereby firmly bonding said foil to said panel.

3,856,609
HANGING DECORATION
Fred L. Maas, Stamford, Conn., assignor to Paper Novelty Manufacturing Co., Stamford, Conn.
Filed Jan. 14, 1974, Ser. No. 433,343
Int. Cl. A47q *33/08*
U.S. Cl. 161—16 **8 Claims**

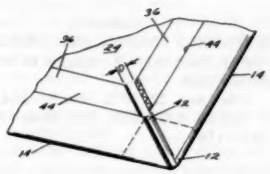
1. Ornament for display be suspension from above and by securement with a surface comprising, in combination, a three-dimensional ornament having at least a front portion, a top portion and a rear portion wherein said rear portion comprises a substantially flat surface angularly disposed relative said top portion, means connected with said top portion for enabling suspension of said ornament from above and means mounted with said flat surface for enabling mounting of said ornament on a surface for display thereon.

3,856,610
AUTOMOBILE FLOOR MAT CONSTRUCTION
Charles H. Bruneel, Mt. Clemens, Mich., assignor to Emerance C. Bruneel, Anchorville and Hubert Champine, Mt. Clemens, both of, Mich., a part interest to each
Filed Aug. 14, 1972, Ser. No. 280,450
Int. Cl. B32b *1/04, 3/10*
U.S. Cl. 161—43 **5 Claims**



1. A floor mat construction for absorbing liquids and holding foreign particles, said mat comprising:
a body portion of a predetermined shape for facilitating the positioning of said mat upon a portion of a floor of an automobile, said body portion having a bottom surface and a top surface, said body portion being a liquid absorbing material and of a strength sufficient to maintain said predetermined shape when the body portion is wet;
a liquid impervious skin completely enclosing said body portion and adhering to the exposed surfaces of said body portion, the portion of said skin in contact with said body portion top surface being perforated to permit liquid and foreign particles thereon to pass therethrough, respectively, for absorption and storage by said body portion, said skin enclosed body portion being of a strength sufficient to support the weight of the feet of a passenger in said automobile; and
an upright ridge disposed along the peripheral edge of said top surface and extending above said top surface to form a barrier to restrain the movement beyond said edge of any liquids and foreign particles disposed on said top surface.

3,856,611
DECORATIVE PANEL WITH FINISHED EDGES
Jerry M. Markley, Wyoming, Mich., assignor to Sackner Products, Inc., Grand Rapids, Mich.
Filed Jan. 12, 1973, Ser. No. 323,141
Int. Cl. B32b *1/04*
U.S. Cl. 161—43 **13 Claims**

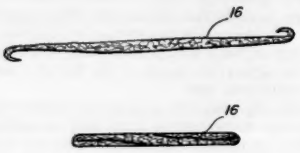


13. A decorative panel comprising in combination a backing support and a flexible covering layer; said backing including front and back surfaces; said covering including at least one extending corner and being secured to said backing support on said front surface along the periphery thereof; said backing support including fold guidelines interior of said periphery separating said backing support into foldable margins and a central support area; said backing support further including at least one truncated corner with an edge; said extending corner being folded over said corner edge and secured to the back of said backing; said foldable margins being folded against said back of said backing and secured thereto in overlapping engagement with said extending corner whereby said cover is wrapped around the periphery of said panel forming finished, covered edges thereon and said extending corner is doubly retained and prevented from loosening; the outside dimensions of said covering being less than the outside dimensions of said backing support and greater than the outline formed by said fold guidelines; said panel further including a padding layer interposed between said backing support and cover; said padding layer having outside dimensions equivalent to the outline formed by said fold guidelines.

3,856,612
NON-WOVEN STRUCTURES

Paul H. McGinnis, Jr., Kings Mountain, N.C., assignor to Celanese Corporation, New York, N.Y.

Filed Aug. 2, 1971, Ser. No. 168,293
Int. Cl. B32b 3/04
U.S. Cl. 161—108 8 Claims



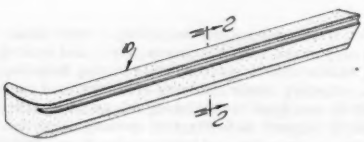
1. A bonded non-woven fabric having parallel sides and being of substantially uniform thickness and density across its width comprising a randomly-laid continuous thermoplastic polymer filament web folded and pressed such that the randomly-laid edges are substantially coincident with the center of the web.

5. A bonded non-woven fabric comprising a random array of continuous thermoplastic filamentary material composed of at least one organic synthetic polymer, said bonded non-woven fabric forming a single planar structure composed of at least two layers of said material calendered together such as to resist delamination, said layers being integrally connected at the outermost edges therefore, the calandered material comprising said portions folded over upon itself and extending across at least half of said folded fabric such that the edges are substantially coincedent with the center of the folded fabric.

3,856,613
COMPRESSIBLE ENERGY ABSORBING ARTICLE

Peter A. Weller, Durham, N.H., assignor to McCord Corporation, Detroit, Mich.

Filed Aug. 28, 1972, Ser. No. 284,318
Int. Cl. B32b 5/08, 7/08; B60r 19/04
U.S. Cl. 161—116 23 Claims

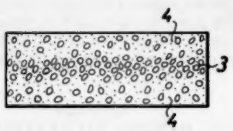


1. An energy absorbing article comprising: core means made of compressible energy absorbing material and having a top and bottom interconnected by a front and back with one of said top and bottom being thinner in thickness than the other as viewed in cross section, and energy transfer means for transferring energy between said top and bottom, and vice versa, in response to a frontal impact, said energy transfer means including at least one member embedded within said energy absorbing material and fulcrum means for establishing a position about which said member may rotate in response to said impact.

3,856,614
FOAMED MATERIALS OF SYNTHETIC RESIN AND LAMINATIONS COMPRISING THE SAME

Rinnosuke Susuki, Tokyo; Hiroshi Hoshi, Narashino; Jiro Saito, Tokyo; Koichi Takano, Tokyo, and Kiyoshi Yoshikawa, Tokyo, all of Japan, assignors to Lion Fat and Oil Co., Ltd., Tokyo, Japan

Filed Sept. 22, 1971, Ser. No. 182,733
Claims priority, application Japan, Sept. 30, 1970, 45-97449; Sept. 30, 1970, 45-97450
Int. Cl. B32b 3/26, 5/18
U.S. Cl. 161—159 8 Claims

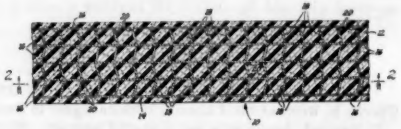


1. A foamed thermoplastic lamination comprising at least two foamed layers bonded to one another in laminated relationship, each layer being a foamed thermoplastic resin material selected from the group of homopolymers, copolymers thereof, and mixtures thereof, and further containing a filler selected from the group consisting of calcium sulfite, gypsum and mixtures thereof in admixture with said thermoplastic resin material, said foamed layers being foamed to extents different from one another.

3,856,615
RESILIENT ENERGY ABSORBING ASSEMBLY

James Howard Dreher, Durham, N.H., assignor to McCord Corporation, Detroit, Mich.

Filed Aug. 28, 1972, Ser. No. 284,317
Int. Cl. B32b 3/00, 5/02; B60r 19/08
U.S. Cl. 161—168 29 Claims



1. An energy absorbing assembly comprising: yieldable means and force transmitting network means disposed at least partially within said yieldable means; said network means including a plurality of spaced elongated means, link members for connecting adjacent elongated means, and joint means for facilitating relative angular movement between said link members and said elongated means, said elongated means and said link members having a depth as viewed in plan to define a plurality of collapsible compartments which collapse in response to a force applied in a direction to urge said elongated means toward one another as said joint means facilitates angular movement between said link members and said elongated means, thereby to compress said yieldable means within said collapsible compartments for absorbing energy.

3,856,616

PHENOLIC RESIN-CONTAINING CELLULOSIC OVERLAYS FOR WOODY SUBSTRATES

James E. Scott, Jr., Homewood, Ill., and Ernest Ray Woodward, Seattle, Wash., assignors to Pacific Resins & Chemicals, Inc., Seattle, Wash.

Filed Nov. 9, 1972, Ser. No. 305,000
Int. Cl. D21d *3/00;* **D21h** *3/50*
U.S. Cl. 162—165 **34 Claims**

1. In a process for producing a resin-containing, cellulosic overlay useful for overlaying woody substrates comprising admixing an aqueous slurry of cellulosic fibers and an alkaline, water-solubilized, phenol-formaldehyde resole resin, precipitating said resin onto said fibers by acidification of said slurry, and forming a dry sheet from the acidified slurry, the improvement wherein:

a. said phenol-formaldehyde resole resin is produced by condensation of phenol and formaldehyde under acidic conditions to form a novolac resin having a formaldehyde : phenol mole ratio of from 0.6 to 0.95; and methylolation of said novolac resin with sufficient additional formaldehyde to produce a resole resin having a formaldehyde : phenol mole ratio of from 1.4 to 2.0; and

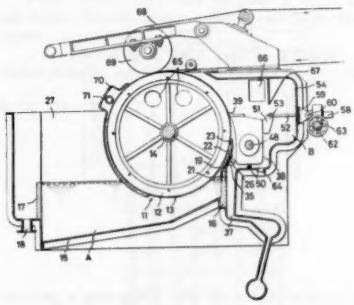
b. said acidification is effected by adding to said slurry an acid selected from sulfuric, hydrochloric, phosphoric, acetic, citric and p-toluenesulfonic acids.

3,856,617

SUCTION CYLINDER PAPER FORMING MACHINE WITH ADJUSTABLE DOCTOR KNIFE SUPPORT STRUCTURE FOR CONTROLLING PAPER THICKNESS

Kazuitsu Fukuzaki, No. 910 Kawanoe-cho, Kawanoe-shi, Japan

Filed June 25, 1973, Ser. No. 373,293
Claims priority, application Japan, July 7, 1972, 47-68326
Int. Cl. D21f *1/04*
U.S. Cl. 162—276 **7 Claims**



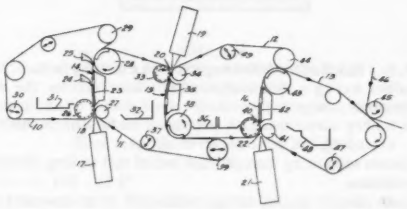
1. A wet paper producing apparatus comprising a tank having two chambers partitioned by a wall: a rotary suction drum mounted in one chamber; a doctor knife supporting box operatively positioned and having a doctor knife at the upper edge of a curved front face of the supporting box confronting the periphery of the suction drum above said partition wall; means coupled to said supporting box for rotating said supporting box about a first pivot for the adjustment of a distance between the doctor knife and the periphery of the suction drum; means coupled to said supporting box for adjusting the angle of said doctor knife with respect to the suction drum and for rotating said supporting box around a second pivot toward and away from the suction drum for the adjustment of the distance between the front face of the supporting box and the periphery of the suction drum; a lip board mounted on the partition wall so as to abut the periphery of the suction drum below said doctor knife; a lip board adjustment means connected to said lip board and adapted to move said lip board up and down for the adjustment of the distance between the doctor knife and the lip board; and a means for supplying slurry to the surface of said suction drum between said lip board and said doctor knife.

3,856,618

MULTI-PLY PAPER FORMING MACHINE WITH UPWARD AND DOWNWARD FORMING RUNS

William J. Roell, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed June 4, 1973, Ser. No. 365,993
Int. Cl. D21f *1/00*
U.S. Cl. 162—299 **5 Claims**



1. A multi-ply board making machine comprising in combination:

first and second looped forming wires;

first and second wire guide means training the wires into a first vertically upwardly extending forming throat leading to a first vertically upwardly extending dewatering run with the wires applying a pressure against a web through said run;

a first headbox positioned to direct a pressure jet of first stock into the first throat;

first and second water receiving means within said first and second loops respectively receiving water expressed from the web in said first run;

a third looped forming wire;

a third wire guide means within the third wire positioned to guide the wire into a vertically downwardly extending second forming throat leading to a vertically downwardly extending second dewatering run with the second wire and the second and third wire applying pressure to the web through said second run;

a second headbox directing a second stock into said second throat onto the web carried on the second wire from the first run thereby forming a second layer on the web;

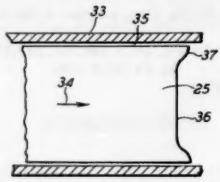
and a water receiving means within the third wire receiving water from said second layer with the first and second layers being bonded to each other by the flow of water during the second run;

each of said forming runs including a series of successive spaced bars extending in a cross-machine direction sequentially engaging the second wire in the first forming run and the third wire in the second forming run, said bars lying in a broad arc of very large radius so that the first and second wires in the first forming run and the second and third wires in the second forming run travel through a plurality of chordal sectors and the web is gently dewatered in both directions in the first run and the second layer is gently dewatered in both directions in the second run so as to cause a bonding between the second layer and first layer.

3,856,619
PAPERMAKING MACHINE HEADBOX WITH SLICE CHAMBER CONTAINING FLEXIBLE TRAILING ELEMENTS HAVING EXTENDED EDGES

George R. Davidson, and David R. Gustafson, both of Rockton, Ill., assignors to Beloit Corporation, Beloit, Wis.

Filed Mar. 7, 1973, Ser. No. 338,679
Int. Cl. D21f 1/02
U.S. Cl. 162—343 9 Claims



1. In a headbox for delivering stock to a forming surface, the headbox having a slice chamber and a slice opening, the improvement comprising:

a trailing element means positioned in the slice chamber extending in a downstream direction;

means supporting the upstream end of said trailing element means;

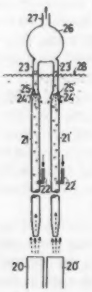
said element means being unattached at its downstream edge and being self-positionable responsive to pressures of stock flowing past the element means toward the slice opening, said element means extending in a direction transversely of the slice chamber and substantially to the pond side of the slice chamber,

said element means having a downstream edge and having a longer portion extending further toward the slice opening at the pond side than the portion inwardly therefrom.

3,856,620
METHODS OF AND APPARATUS FOR DETECTING A FAILED FUEL ASSEMBLY

Ken Tomabechi, Tokyo, Japan, assignor to Doryokuro Kakunenryo Kaikatsu Jigyodan, Tokyo, Japan

Filed May 15, 1972, Ser. No. 253,114
Claims priority, application Japan, May 20, 1971, 46-34335
Int. Cl. G21c 17/00
U.S. Cl. 176—19 3 Claims

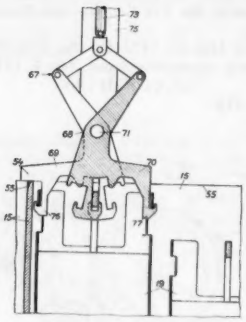


1. An apparatus for detecting a failed fuel assembly in a nuclear reactor, which comprises a plurality of tubes to separately sample coolant flowing out of a plurality of fuel assemblies and to extract fission products by means of a carrier gas from said sampled coolant; a plurality of gas blowing means each having a valve means through which said carrier gas can be blown into said sampled coolant, each of said valve means being independent of the others of said valve means such that said valve means can be opened at the same time or one at a time; means for releasing most of said sampled coolant outside of said tubes, comprised of a plurality of conduits each having an outwardly spread open end and a baffle plate, each of said conduits being placed over each of said tubes so that said outwardly spread open end covers said open upper end of each of said tubes at a suitable distance, said baffle plate being placed over said open upper end of each of said tubes within the inner portion of said outwardly spread open end; a gas collecting chamber associated with said conduits to collect gas blown into said coolant samples; means for detecting radioactivity of said collected gas; and means for circulating said collecting gas to said gas blowing means after determining its radioactivity.

3,856,621
BLOCKING ARRANGEMENT FOR MECHANISM FOR HANDLING FUEL ASSEMBLIES IN NUCLEAR REACTORS

Antti Suvanto, and Ake Fries, both of Vasteras, Sweden, assignors to Aktiebolaget Asea-Atom, Vasteras, Sweden

Continuation of Ser. No. 30,096, April 20, 1970, abandoned.
This application July 17, 1972, Ser. No. 272,139
Claims priority, application Sweden, Apr. 21, 1969, 5575/69
Int. Cl. B66c 1/66; G21c 19/10
U.S. Cl. 176—30 4 Claims



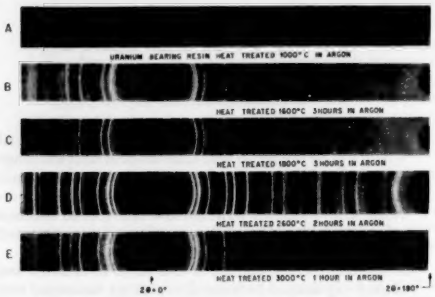
1. In a nuclear reactor, a core comprising a plurality of vertically arranged elongated fuel assembly containers, a container grid transverse to said containers, the grid having upwardly facing top surfaces, each container position being surrounded along part only of its circumference by adjacent grid portions having such top surfaces, fuel assemblies individually mounted in said containers within said grid, each fuel assembly having a lifting handle lying mainly in a vertical plane, a gripping device for moving fuel assemblies to and from said containers, the gripping device having a handle hook means and a simultaneously operating container gripping hook means, said container and handle hook means always having the same mutual orientation during engagement of said handle hook means with the handle, said container having attachment apertures for said container gripping hook means, said gripping device having a stop, the upwardly facing top surfaces of said adjacent grid portions constituting a blocking surface engageable with said stop at undesired angular orientations of said handle in relation to grid parts lying in vertical planes.

3,856,622

HIGH TEMPERATURE NUCLEAR REACTOR FUEL

Charles B. Pollock, Oak Ridge; James L. Scott, Knoxville, and James M. Leitnaker, Kingston, all of Tenn., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Apr. 18, 1972, Ser. No. 246,096
Int. Cl. G21c *3/04*
U.S. Cl. 176—68 3 Claims



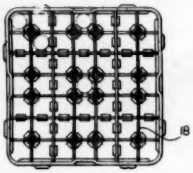
1. A nuclear fuel kernel comprising a matrix phase of carbon or graphite and a dispersed phase of a crystalline uranium compound consisting essentially of uranium, carbon, an ameba-inhibiting concentration of from 2 to 10 weight percent sulfur, and up to 0.5 weight percent oxygen, said fuel kernel further characterized in that it shows inhibition of uranium migration across a temperature gradient at a temperature in excess of 1200°C. and has an X-ray diffraction pattern which is distinguishable from UO_2, UC, or US.

3,856,623

FUEL ASSEMBLY FOR NUCLEAR REACTOR

Yasuo Kamo, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 2, 1972, Ser. No. 277,232
Claims priority, application Japan, Aug. 6, 1971, 46-59049
Int. Cl. G21c *3/30*
U.S. Cl. 176—78 9 Claims



1. A fuel assembly for a nuclear reactor, said assembly comprising a plurality of fuel rods, an upper tie plate and a lower tie plate provided, respectively, at upper and lower ends of the fuel rods for holding the fuel rods, an upper mounting frame and a lower mounting frame provided adjacent to the respective tie plates to surround the fuel rods, a plurality of segment spacers arranged between said upper and lower mounting frames to surround the fuel rods and hold the fuel rods at an appropriate separation, and connecting parts on facing end portions of said upper and lower mounting frames and each of said plurality of segment spacers to connect the mounting frames to said segment spacers and to connect adjacent segment spacers together, and wherein said connecting parts include a combination of guide plates and pivots in engaging relationship to a combination of guide grooves and openings.

3,856,624

PROTEIN MOLECULAR PROSTHESIS MEDIATED BY CARBAMYL PHOSPHATE AND CARBAMYL PHOSPHATE DERIVATIONS

Alfred P. Kraus; Lorraine M. Kraus, and John L. Wood, all of Memphis, Tenn., assignors to The University of Tennessee Research Corporation, Knoxville, Tenn.

Filed Sept. 18, 1972, Ser. No. 289,942
Int. Cl. A61k *27/00*
U.S. Cl. 195—1.8 10 Claims

1. A method for the inhibition of the sickling of erythrocytes in the blood of humans containing hemoglobin S comprising incubating said blood in vitro with an amount of carbamyl phosphate and for a time sufficient to inhibit the sickling of said erythrocytes.

3,856,625

PROCESS FOR THE PRODUCTION OF POLYSACCHARIDE

Frazer Keith Elliott Imrie, Wallington, England, assignor to Tate & Lyle Limited, London, England

Filed May 29, 1973, Ser. No. 364,254
Int. Cl. C12b *1/00*
U.S. Cl. 195—31 P 10 Claims

1. A process for the production of a polysaccharide consisting of a partially acetylated variable block copolymer of 1–4 linked *d*-mannuronic acid and *l*-guluronic acid residues, which process comprises the steps of:

a. inoculating an aqueous final culture medium with a bacterium of the species *Azotobacter vinelandii*, said medium having a pH in the range of from about 7.0 to about 8.2 and containing as essential ingredients at least one carbon source selected from the group consisting of monosaccharides and disaccharides, at least one phosphate source in an amount such that the concentration of phosphate in the medium is in the range of from about 0.1 to about 0.8 millimolar, and sources of molybdenum, iron, magnesium, potassium, sodium, calcium and sulfate;

b. cultivating said bacterium in said medium under aerobic conditions, while maintaining the pH of the medium within the range of from about 7.0 to about 8.2, until a substantial formation of polysaccharide has occurred; and

c. recovering a polysaccharide-containing culture broth.

3,856,626

FERMENTATION PROCESS FOR THE SIMULTANEOUS PRODUCTION OF PROTEIN AND BIO POLYMERS

Allen Clamen, Westfield, N.J., and Bruce L. Dasinger, Niantic, Conn., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed June 9, 1972, Ser. No. 261,191
Int. Cl. C12d *1/00*
U.S. Cl. 195—49 9 Claims

1. A process for simultaneously producing bio-polymer and bacteria cells in a single fermentation zone comprising continuously cultivating a microorganism selected from the group consisting of *Achromobacter sp. ATCC* 21575, ATCC No. 21576, ATCC No. 21578, *Alcaligenes faecalis* ATCC No. 21577 on an oxygenated hydrocarbon feed in a media comprising an aqueous growth medium containing oxygen and other essential cell nutrients at temperatures ranging from about 20°to about 65°C.

3,856,627

CULTURE MEDIUM FOR BACTERIA

Taro Nagasawa; Kozo Hamada; Hiroya Yuguchi, and Kenji Mizuguchi, all of Tokyo, Japan, assignors to Morinaga Milk Industry Co., Ltd.

Filed May 7, 1973, Ser. No. 357,922

Claims priority, application Japan, Dec. 11, 1972, 47-124123

Int. Cl. C12k *1/10*

U.S. Cl. 195—100 2 Claims

1. The culture medium FLP-1 as a substitute for a brain heart infusion culture medium, prepared by dissolving dried fish protein hydrolysate containing more than 80% hydrolyzed fish protein, sodium chloride, dextrose and dipotassium phosphate in water and adjusting said prepared culture medium at a pH of about 7.0.

3,856,628

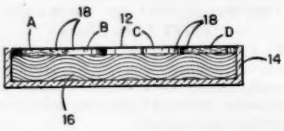
METHOD AND APPARATUS FOR THE IDENTIFICATION OF MICROORGANISMS

Anthony J. Sbarra, Milton, Mass., assignor to Richard P. Crowley, Wellesley Hills, Mass., a part interest

Filed May 17, 1972, Ser. No. 254,193

Int. Cl. C12k *1/04*

U.S. Cl. 195—103.5 R 12 Claims



1. Means useful to identify a microorganism through a change in abosrbent by the reaction or nonreaction of the microorganism with a carbohydrate comprising:

a. an essentially flat sheet of absorbent material adapted to be placed onto the top surface of a culture medium containing a microorganism where identity is to be determined;

b. the absorbent material free of restriction on at least one surface thereof and having a plurality of distinct and separate test zones thereon in a sufficient number such that the microorganism can be identified;

c. each test zone containing absorbed thereon in combination a carbohydrate and a pH color indicator of phenol red, which indicator changes color about the periphery of the test zone on the fermentation of a carbohydrate by the microorganism; and

d. the indicator employed in each test zone being the said phenol red and the carbohydrate in each test zone a different carbohydrate, whereby the absorbent sheet may be placed on top of a culture medium containing a microorganism in a culture plate, and the change in color and lack of color change about the periphery of the test zones used to identify the presence or absence of a particular microorganism.

3,856,629

FRACTIONATOR AND METHOD OF FRACTIONATING

Charles C. Chapman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 9, 1972, Ser. No. 261,368

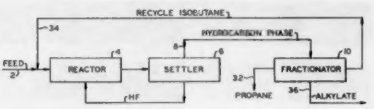
Int. Cl. B01d *3/14*

U.S. Cl. 202—158 2 Claims

1. Fractionation apparatus adapted to separate fluid mixture into at least three products, comprising:

a vessel adapted to be mounted in a vertical position;

a first partition extending from the top of said vessel downwardly to a first location between the top and the bottom of the vessel, a second partition extending from the top of said vessel downwardly to a second location which is lower than said first location and which is between the top and bottom of said vessel, said partitions being spaced from one another and extending across said vessel to divide the vessel into first and second separate upper regions which are separated by the first and second partitions above the first location and by the second partition between the first and second locations, said vessel being provided with an inlet opening in the top thereof between the partitions so that the space between the partitions



serves as an inlet conduit to permit introduction of a feed mixture to be separated into said vessel in heat exchange relationship with fluids in the first and second upper regions above said first location, said vessel being provided with a product outlet below said second location and separate product outlets in each of said first and second upper regions; and

fractionation trays positioned in said vessel in said first and second regions and between said product outlet and said second location.

3,856,630

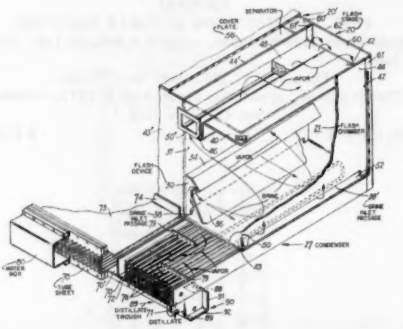
EVAPORATOR FABRICATED FROM PRE-FORMED SHEETS

Frederick W. Gilbert, Shreveport, La., assignor to Riley-Beaird Inc., Chicago, Ill.

Filed Jan. 10, 1973, Ser. No. 322,322

Int. Cl. B01d *1/28, 3/02*

U.S. Cl. 202—173 9 Claims



1. In a multi-stage flash evaporator that includes a longitudinal succession of hollow rectangular prisms forming successive continuous flash chambers, the combination comprising a pre-formed L-shaped elongated continuous sheet of material extending longitudinally throughout a plurality of said stages and having a first small-radius substantially right angle bend throughout its longitudinal extent to connect first and second angularly disposed planar arm portions,

said bent continuous sheet being arranged with its first planar arm portion disposed horizontally to form floors for adjacent ones of successive flash chambers and having its second planar arm portion extending vertically and longitudinally to form side walls for adjacent ones of successive flash chambers,

a plurality of first pre-formed substantially L-shaped members each formed of a unitary sheet of material having a small-radius substantially right angle bend across its width

dimension to provide an angled edge portion between two angularly disposed planar leg portions,

said first L-shaped members being successively arranged so as said radius bend is substantially vertical and the bottom edge of the first leg portion of each first member is aligned along and welded to the outermost longitudinal edge of the first planar arm portion of said elongated sheet and with the bottom edge of its second leg portion extending transversely across and also welded to said first planar arm portion and said second leg portion terminating at its outermost edge in a welded joint with the interior face of said vertically disposed second arm portion, the vertical edge of the first leg portion of each of said first L-shaped members being welded along its outermost edge to the angled edge portion of the immediately adjacent L-shaped member, whereby the second leg portions of said L-shaped members form transverse vertical back and front walls, respectively, of adjacent flash chambers, liquid input means in the lower part of each of said front walls for permitting liquid flow from flash chamber to flash chamber,

declined plate flashing means associated with the downstream side of each input means for flashing into vapor at least a portion of the liquid entering each flash chamber, a roof disposed across each flash chamber,

separator means in the roof and top portion of each flash chamber for separating vapor and entrained mist produced in the respective flash chamber.

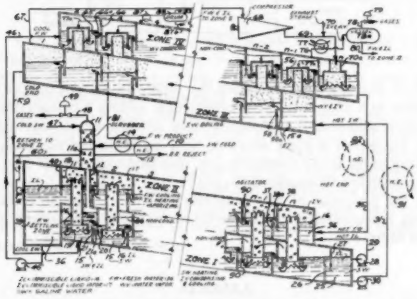
3,856,631
PROCESS AND APPARATUS FOR SEPARATING WATER FROM NON-VOLATILE SOLUTES

Calvin S. Smith, Jr., El Cerrito, Calif., assignor to Harrison W. Sigworth, Orinda and Thomas N. Finical, Jr., San Carlos, both of, Calif., a part interest to each

Continuation-in-part of Ser. No. 19,592, March 16, 1970, Pat. No. 3,640,850. This application Feb. 7, 1972, Ser. No. 224,018

Int. Cl. B01d *3/02, 3/00, 3/10*

U.S. Cl. 203—11 **24 Claims**



1. Apparatus for the direct contact transfer of latent heat of condensation of the vapor of an immiscible liquid A to a dilute solution S comprising a liquid B, such solution containing a non-volatile solute, and for evaporation of liquid B from the solution S, said liquids A and B being immiscible and liquid A having a narrow boiling range lower than the boiling point of liquid B and having a density different than the density of solution S, said apparatus comprising:

a. a first (solution S heating) zone (zone I) divided into a plurality of stages and including an input stage an output stage and a plurality of intermediate stages,

b. means providing for flow of solution S between but preventing flow of vapor between successive stages of zone I except for minor flow of bleed gases,

c. a second (liquid A vaporizing) zone (zone II) divided into a plurality of stages corresponding to and paired with the stages of zone I and including an input stage, an output stage and a plurality of intermediate stages, said zone I and zone II stages being arranged for countercurrent flow of liquids in the two zones,

d. means providing for flow of liquid between but preventing flow of vapor between successive stages of zone II except for minor flow of bleed gases,

e. vapor transfer means between each pair of corresponding stages of zone II and zone I whereby vapor of liquid A generated in the respective stage of zone II is caused to pass in finely divided form into a body of solution S in the respective stage of zone I and to form a liquid condensate (liquid A) therein thus heating solution S,

f. a third (solution S flashing) zone (zone III),

g. a fourth (liquid B vapor condensing) zone (zone IV),

h. means for separating heated solution S from condensate (liquid A) derived from the output stage of zone I,

i. means for transferring the resulting separated condensate of liquid A to the input stage of zone II for re-evaporation therein,

j. means for transferring resulting separated heated solution S to and through zone III to be flashed therein to produce vapor of liquid B and means for recycling a portion of the unevaporated solution S from the output stage of zone III to the input stage of zone I and withdrawing the remainder of unevaporated solution S from the system,

k. means for transferring vapor of solution S formed by flashing in zone III to liquid B flowing in zone IV and condensing such vapor therein, and

l. means for circulating resulting condensate of vapor of solution S in admixture with liquid B through zone IV to the input stage of zone II in admixture with liquid A from elements (h) through zone II and back to zone IV to condense vapor of solution S in zone IV and to evaporate liquid A in zone II.

3,856,632
METHOD AND APPARATUS FOR PRODUCING A DISTILLATE

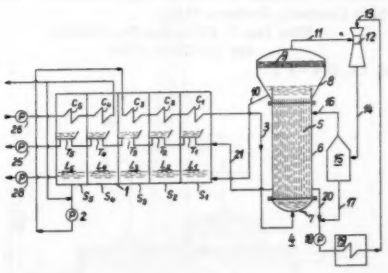
Klaus-Dieter Peter, Varrel, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed July 17, 1973, Ser. No. 379,978

Claims priority, application Germany, July 26, 1972, 2236519

Int. Cl. B01d *3/06*

U.S. Cl. 203—11 **10 Claims**



1. In a method for producing a distillate from raw water by the use of a multi-stage flash evaporator each stage of which includes an evaporation zone, a condensation zone and a distillate collection zone, the method including preheating raw water by passing it through the condensation zones of a plurality of the flash evaporator stages, partially evaporating the untreated water in the evaporation zones of the flash evaporator stages, condensing the evaporated water in the condensation zones of the flash evaporator stages, collecting the condensed water at the distillate collection zones of the flash evaporator stages, removing inert gases from the evaporation

zones, and adding additional heat energy to the evaporation system, the improvement comprising:

conveying the preheated raw water from the last of the condensation zones through which it passes to a vertical tube evaporator;

passing such water through the vertical tube evaporator;

evaporating a portion of the water passing through the vertical tube evaporator by bringing it into heat-exchange communication with a heating medium;

removing the resulting vapor from the vertical tube evaporator;

compressing the removed vapor to a higher saturation temperature by means of a heat pump comprising a hot water ejector which receives said removed vapor and an ejector motive water pump connected to said hot water ejector for supplying hot water to said hot water ejector and returning the vapor to the vertical tube evaporator as the heating medium, the transfer of heat from such heating medium to the water passing through the vertical tube evaporator causing the vapor constituting the heating medium to condense;

conveying a first portion of the condensed heating medium, as a distillate, from the vertical tube evaporator to the flash evaporator distillate collection zones to transfer part of the heat contained in the condensed medium, by stepwise evaporation, to the raw water passing through the condensation zones;

conveying a second portion of the condensed heating medium to the ejector motive water pump;

conveying the portion of the water which passed through the vertical tube evaporator without evaporation through the evaporation zones of the flash evaporator stages in succession for causing such water to partially evaporate in a stepwise manner in the stages, to transfer heat to the raw water passing through the flash evaporator zones, and to condense as a result of such heat transfer; and

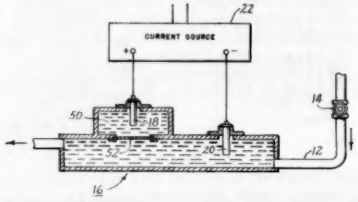
collecting the distillate from the respective distillate collection zones of the flash evaporation zone and from the vertical tube evaporator, and having the distillate production in the flash evaporator higher than the distillate production in the vertical tube evaporator.

3,856,633

CONCENTRATION MEASUREMENTS UTILIZING COULOMETRIC GENERATION OF REAGENTS

Kenneth S. Fletcher, III, Norfolk, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Jan. 7, 1971, Ser. No. 104,661
Int. Cl. G01n *27/46*
U.S. Cl. 204—1 T **1 Claim**



1. A method of analyzing the concentration of the ions of a flowing fluid sample the ions of which react chemically with silver ions, and wherein the fluid sample includes an oxidizing medium, said method comprising the steps of:

flowing current through a pair of electrodes, one of which is a silver electrode in a silver solution, to generate coulometrically a reagent containing silver ions for reacting chemically with ions of the fluid sample;

transferring said silver ions into said fluid sample to form a solution effecting said chemical reaction, to reduce the concentration of said silver ions by an amount proportional to the concentration of ions in the fluid sample;

isolating said silver electrode from said flowing fluid sample by interposing therebetween a silver-sulfide membrane which allows only silver ions to pass therethrough, whereby to prevent said oxidizing medium from reaching said silver electrode and generating additional silver ions; flowing said solution by one side of a silver-sulfide membrane system sensitive to silver ions;

flowing a known concentration of silver ions by the other side of said silver-sulfide membrane system; and

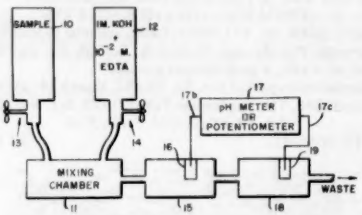
sensing the signal developed by said silver-sulfide membrane system to effect a measurement of the ionic concentration of the fluid sample.

3,856,634

METHOD FOR MEASURING DISSOLVED OXYGEN IN AQUEOUS SOLUTION USING TUNGSTEN BRONZES AS A POTENTIOMETRIC INDICATING ELECTRODE

Paul B. Hahn; Dennis C. Johnson; Howard R. Shanks, all of Ames, Iowa, and Margaret A. Wechter, Hammond, Ind., assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Mar. 19, 1973, Ser. No. 342,682
Int. Cl. G01n *27/46*
U.S. Cl. 204—1 T **7 Claims**



1. A method of determining the dissolved oxygen concentration in a sample solution comprising: adding a complexing agent to said sample to complex metal ions therein; contacting the sample in a basic solution with an indicator electrode having as an active element a non-stoichiometric bronze crystal responsive to dissolved oxygen in said sample; and measuring the potential of said indicator electrode, said potential being representative of the dissolved oxygen concentration in said sample.

3,856,635

FORMATION OF THE ROTOR TRACK OF A ROTARY ENGINE

Henry Brown, Huntington Woods, Mich., assignor to Oxy Metal Finishing Corporation, Warren, Mich.

Filed Dec. 28, 1972, Ser. No. 316,207
Int. Cl. C23b *7/02, 7/00*
U.S. Cl. 204—9 **9 Claims**

1. A method for forming a housing comprised of aluminum for the rotor track of a rotary internal combustion engine, which comprises the steps of:

1. electrodepositing a first layer on to a mandrel of the shape of the track of the rotor, said first layer being separable from the mandrel during subsequent steps; 2. electrodepositing a wear resistant layer on to said first layer;

3. forming on to the wear resistant layer a metallic layer useful for improving adhesion of the aluminum casting to the previously formed wear resistant layer;

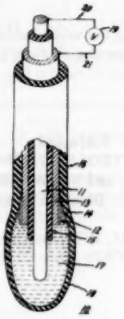
4. electrodepositing zinc on to the mandrel, electrodepositing copper on to the zinc deposit, electrodepositing a plate comprised of iron of a thickness of about 1 to about 10 mils containing about 2 to about 8 weight percent fine silicon carbide particles, and electrodepositing a zinc deposit of a thickness of about 0.1 mil to about 2 mils;
5. then casting a housing comprised of aluminum; and
6. separating the housing from the mandrel.

3,856,636

OXYGEN SENSOR

Willard T. Grubb, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 30, 1972, Ser. No. 310,772
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 P **3 Claims**



1. A chemically biased oxygen sensor comprising of a first electrode of platinum, an electrical lead connected to the first electrode, a second electrode spaced from the first electrode, a second electrode comprising silver with at least a partial layer of silver halide thereon, an electrical lead connected to the second electrode, an aqueous pH 5 buffered electrolyte solution containing a halide salt and 0.5 to 5.0 weight percent of an oxidizable fuel selected from the class consisting of alcohols, ethylene glycol, glycerol, and polymers containing COH groups contacting at least a portion of both electrodes, and a high impedance voltmeter connected to the opposite ends of the electrical leads.

3,856,637

METHODS OF ELECTROPLATING ZINC AND CYANIDE FREE OR LOW CYANIDE ZINC PLATING BATHS THEREFOR

Richard B. Kessler, Jericho, and Fred I. Nobel, Roslyn, both of N.Y., assignors to Lea-Ronal, Inc., Freeport, N.Y.

Filed July 9, 1973, Ser. No. 377,817
Int. Cl. C23b *5/10, 5/46, 5/62*
U.S. Cl. 204—29 **5 Claims**

1. An alkaline zinc electroplating solution containing water and less than about 15 gms./l of free cyanide, a soluble zinc compound for supplying zinc to be electrolytically deposited on an object, a brightening compound capable of producing a bright or semi-bright zinc deposit but which will produce a dull, smeary, or smutty zinc deposit because of impurities in the water and to which has been added at least about 0.001 oz./gal. of an alkaline soluble metal silicate to substantially eliminate dull, smeary or smutting deposits.

3,856,638

BRIGHT GOLD ELECTROPLATING BATH AND METHOD OF ELECTROPLATING BRIGHT GOLD

Maurice Bick, South Orange, and Jean A. Lochet, Metuchen, both of N.J., assignors to Auric Corporation, Newark, N.J.

Continuation-in-part of Ser. No. 176,263, Aug. 20, 1971, abandoned. This application Apr. 26, 1973, Ser. No. 354,682
Int. Cl. C23b *5/28, 5/42, 5/46*
U.S. Cl. 204—43 G **10 Claims**

1. A bright gold electroplating bath, comprising:
an aqueous solution of an alkali metal gold cyanide, said gold being present in concentrations of from about 2 g/l to saturation;
between 4 mg/l and 40 grams/l calculated as the metal, of an alloying agent selected from one or more members of the group consisting of cobalt and nickel, said agent being added to said bath as a complex with at least aminoguanidine and a chelating phosphonic acid; the concentration of said aminoguanidine being from about 2 g/l to 50 g/l, and said phosphonic acid being present in sufficient quantity to complex said alloying agent;
as additional conducting and buffering agents, one or more bath soluble phosphates;
the pH of said bath being between 3 and 6, and the concentration of said conducting and buffering agents being appropriate in the presence of the remaining bath components to adjust the bath specific gravity to a desired level of from about 6° up to 20° Baume, said level being above that which would be achieved in the absence of said agents.

3,856,639

HIGH-LEVEL LIGHT TOWER WITH LIGHT LOWERING DEVICE AND CONTROL SYSTEM THEREFOR

Ivan D. Rohn, Washburn; Richard A. Kleine, and Charles A. Wright, both of Peoria, all of Ill., assignors to Rohm Manufacturing Co., Peoria, Ill.

Filed Dec. 15, 1969, Ser. No. 884,838
Int. Cl. F21v *21/38*
U.S. Cl. 240—64 **34 Claims**

1. In combination with an illuminating instrument tower;
a head structure having a plurality of lateral supporting arms; means securing said arms to the tower;
said arms comprising respective assemblies of angular bars secured rigidly together and sloping downwardly and outwardly relative to the axis of the tower,
a carriage having lights or instruments mounted thereon; and
means for suspending the carriage from the arms to provide at least three points of suspension for maintaining the

carriage in a stabilized condition and to permit the carriage to be moved up to an operating position and down for servicing of the instruments at ground level.

3,856,640

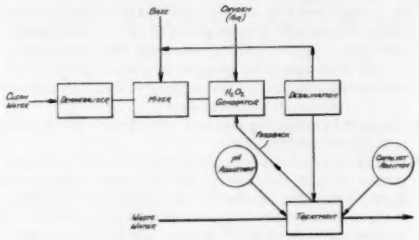
PRODUCTION OF HYDROGEN PEROXIDE

Kurt Halfar, Meinier-Geneva; Michael L. Hitchman, and Wolfgang Mehl, both of Geneva, all of Switzerland, assignors to H. Dudley Wright, Geneva, Switzerland

Continuation-in-part of Ser. No. 149,194, June 2, 1971, abandoned. This application May 30, 1972, Ser. No. 257,955

Int. Cl. C01b *15/02*; **B01k** *1/00, 3/04*

U.S. Cl. 204—84 **4 Claims**



1. An improved process for producing aqueous hydrogen peroxide including the step of passing an electric current through an aqueous electrolyte between an anode and a cathode wherein one surface of said cathode is in contact with said electrolyte and another surface of said cathode is in contact with an oxygen containing gas, wherein the improvement comprises employing as said cathode a flexible, gas-permeable membrane having a thickness of from about 0.1 to about 2 millimeters and a density of from about 0.4 to about 0.8 grams per cubic centimeter, said membrane consisting essentially of from about 95 to about 10 weight percent of finely divided, porous, high surface area carbon dispersed through from about 5 to about 90 weight percent of sintered, finely-divided particles of a hydrophobic polymer of a monomer of the fomula:

$$RR^1C=CF_2$$

wherein R is hydrogen, halogen or trifluoromethyl and R^1 is hydrogen or halogen, said carbon having a particle size of from about 10 to about 500 millimicrons and said polymer having a particle size of not greater than about 0.5 microns before sintering.

3,856,641

METHOD OF OBTAINING VANADIC OR TUNGSTIC OR MOLYBDIC HYDROXIDE

Hans Rothmann, and Werner Keil, both of Nurnberg, Germany, assignors to Gesellschaft Fur Elektrometallurgie m.b.H., Dusseldorf, Germany

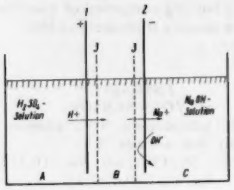
Filed Sept. 18, 1972, Ser. No. 289,967

Claims priority, application Germany, June 9, 1972, 2228065

Int. Cl. C01b *13/14*

U.S. Cl. 204—96 **8 Claims**

1. A method of producing vanadic, tungstic or molybdic hydroxide from aqueous alkali salt solutions containing vanadium, tungsten or molybdenum ions with the simultaneous recovery of alkali hydroxide by applying electric current between an anode and a cathode; comprising abstracting alkali metal ions by the electric current from the said solution until the isoelectric point is reached in the center chamber of a three-chambered electrolytic cell in which the center chamber is separated from the anode and cathode chambers by cation exchaanger diaphragms, the anolyte containing a mineral acid, the center chamber containing a heavy metal-alkali salt solution, and the catholyte containing an alkali metal hydroxide whereby vanadic, tungstic or molybdic hydroxide is precipitated, and recovering the said vanadic, tungstic or molybdic hydroxide, and recovering alkali hydroxide from the said cathode chamber.



3,856,642

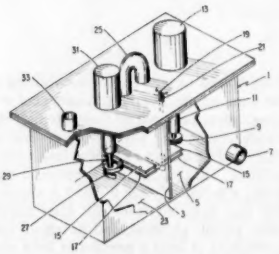
METHOD FOR ELECTROSANITIZING WASTE WATER

Donald F. Lieb, Mentor, and Neil W. Stillman, Madison, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed June 21, 1973, Ser. No. 372,085

Int. Cl. C02b *1/82*; **C02c** *5/12*

U.S. Cl. 204—149 **4 Claims**



1. A process for the treatment of waste water, which process comprises:

a. providing a batch of an alkali metal chloride-containing waste water to a first container;

b. agitating and macerating said waste water whereby any solids contained therein are comminuted;

c. while agitating and macerating, subjecting said waste water to electrolysis whereby chlorine is produced;

d. halting said agitation, maceration, and electrolysis;

e. subsequently, by means of a second batch of alkali metal chloride-containing waste water, transferring the thus-treated waste water to a second container wherein it is further agitated and subjected to chlorine-producing electrolysis; and

f. removing the thus-purified water from said second container by means of the introduction of a further batch to the first container.

3,856,643

PHOTOCURABLE COMPOSITIONS CONTAINING POLYVALENT METAL SALTS OF UNSATURATED MONO OR DICARBOXYLIC ACIDS

Hideo Nakamoto; Juichi Kobayashi, and Takashi Kobayashi, all of Nagoya, Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Filed Sept. 18, 1973, Ser. No. 398,337

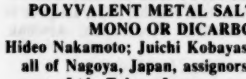
Claims priority, application Japan, Sept. 19, 1972, 47-93210

Int. Cl. B01j 1/10, 1/12

U.S. Cl. 204—159.15 7 Claims

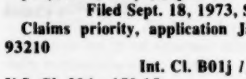
1. A resinous composition curable by photo-irradiation which comprises:

A. At least one divalent or trivalent metal salt of unsaturated mono- or di-carboxylic acids selected from the group consisting of



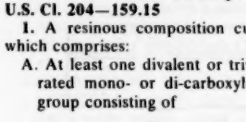
(I)

wherein R and R_1 are hydrogen or methyl; X is a divalent or trivalent metal atom and n is an integer of 2 or 3,

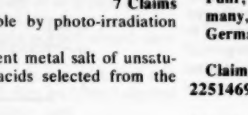


(II)

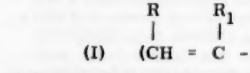
wherein R and R_1 are defined as above, R_2 is an alkylene group having 2 to 10 carbon atoms, polyethylene glycol residual group or polypropylene glycol residual group, and R_3 is



or



wherein R_4 and R_5 represent hydrogen or alkyl having 1 to 4 carbon atoms, and X and n are as defined above; and



(III)

wherein m is an integer of 2 or 3 and X and n are as defined above,

B. At least one unsaturated compound having 0.5 to 12 polymerizable unsaturated bonds per unit molecular weight of 1000, being selected from the group consisting of

1. A divinyl reaction product of a polyepoxy having an epoxy equivalent of 100 to 2000, and an unsaturated monocarboxylic acid, in a ratio of one epoxy group per one carboxylic acid group,
2. A tetra or hexa vinyl ester condensate reaction product of said divinyl product (1) above, and a diisocyanate in a ratio of 2:1 to 3:2,
3. AN unsaturated resin reaction product of dicarboxylic acid and glycidyl acrylate or methacrylate in a molar ratio of 1:2,
4. Reaction product of (3) above with a diisocyanate in a ratio of 2:1 to 3:2,
5. Di, -tri, or tetra-vinyl condensation reaction product of a polyol and an unsaturated carboxylic acid and halide thereof in an equivalent ratio, and

C. At least one photosensitizer wherein the quantity of (A) and (B) is from 2 to 60% by weight and from 98 to 40% by weight, respectively based on the total weight of (A) and (B), and wherein the photosensitizer is used in an amount of 0.1 to 15% by weight, based on the weight of the resinous composition.

3,856,644

HIGHLY REACTIVE UNSATURATED POLYESTER RESIN COMPOSITIONS WHICH CONTAIN ACRYLAMIDE-METHYLOL-ETHERS AND CAN BE CURED BY UV-LIGHT

Hans-Joachim Traenckner, Krefeld-Fischeln; Hans Rudolph, Krefeld-Bockum; Hans Jurgen Rosenkranz, Krefeld; Karl Fuhr, Krefeld, and Manfred Patheiger, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 12, 1973, Ser. No. 405,878

Claims priority, application Germany, Oct. 20, 1972, 2251469

Int. Cl. B01j 1/10; C08d 1/00

U.S. Cl. 204—159.15 15 Claims

1. A resin composition that can be cured by ultra-violet light, which composition contains (a) 10–90 percent by weight of an unsaturated polyester based on one or more α,β-unsaturated dicarboxylic acids and at least one polyol wherein said polyol contains an allyl ether of a polyfunctional alcohol, said polyfunctional alcohol being at least trifunctional, (b) 90–10 percent by weight of one or more ethers selected from the alkyl, cycloalkyl, aralkyl and alkenyl ethers of N-methylolacrylamide and of N-methylolmethacrylamide, and (c) 10–0.3 percent by weight referred to the sum of component a) and component b) of a photoinitiator.

3,856,645

RADIATION CURING OF SOLID STYRENE-ALLYL ALCOHOL COPOLYMER BASED POLYENE-POLYTHIOL COMPOSITIONS

Charles R. Morgan, Silver Spring, Md., assignor to W. R. Grace & Co., New York, N.Y.

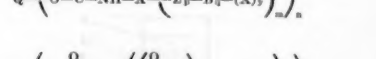
Division of Ser. No. 250,729, May 5, 1972, Pat. No. 3,834,421. This application Dec. 18, 1973, Ser. No. 425,746

Int. Cl. B01j 1/10; C08d 9/10; C08f 29/20

U.S. Cl. 204—159.19 9 Claims

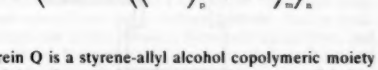
1. A process of forming a solid cross-linked polythioether which comprises admixing

1. a solid polyene containing at least 2 reactive unsaturated carbon to carbon bonds per molecule selected from the group consisting of polyene compounds having the general formula:



(I)

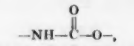
and



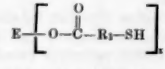
(II)

wherein Q is a styrene-allyl alcohol copolymeric moiety remaining after *n* hydroxyl groups of a styrene-allyl alcohol copolymer have reacted to form (i) *n* urethane linkages in Formula I and (ii) *n* ester linkages in Formula II; A and B are polyvalent organic radical members free of reactive carbon to carbon unsaturation and are independently selected from the group consisting of aryl, substituted aryl, aralkyl, substituted aralkyl, cycloalkyl, substituted cycloalkyl, alkyl and substituted alkyl containing 1 to 36 carbon atoms and mixtures thereof, said group members can be internally connected to one another by a chemically compatible linkage selected from the group consisting of —O—, —S—, carboxylate, carbonate, carbonyl, urethane and substituted urethane, urea and substituted urea, amide and substituted amide, amine and substituted amine and hydrocarbon; Z is a divalent chem-

ically compatible linkage selected from the group consisting of



$-O-$, and $-S-$; X is a member selected from the group consisting of: (a) $-(CH_2)_d-CR'=CHR$, (b) $-O(CH_2)_d-CR'=CHR$, (c) $-S-(CH_2)_d-CR'=CHR$, (d) $-(CH_2)_d-C$ CR, (e) $-O-(CH_2)_d-C$ CR, (f) $-S-(CH_2)_d-C$ CR, and mixtures thereof; where R and R' are each independently selected from the group consisting of hydrogen and methyl radicals; d, k, p and q are each integers from 0 to 1; y is an integer from 1 to 10; m and n are each integers of at least 1; with the proviso that when n is 1, y or m is at least 2; and (2) a solid polythiol containing at least 2 thiol groups per molecule of the general formula:



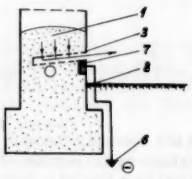
wherein x is an integer of at least 2; E is a styrene-allyl alcohol copolymeric moiety remaining after removal of x hydroxyl groups from a styrene-allyl alcohol copolymer to form x ester linkages; and R_3 is a polyvalent organic radical member free of reactive carbon to carbon unsaturation and is selected from the group consisting of aryl, substituted aryl, aralkyl, substituted aralkyl, cycloalkyl, substituted cycloalkyl, alkyl and substituted alkyl groups containing 1 to 16 carbon atoms and mixtures thereof, the total combined functionality of (1) the reactive unsaturated carbon to carbon bonds per molecule in the polyene and (2) the thiol groups per molecule in the polythiol being greater than 4, and thereafter exposing the mixture to actinic radiation or ionizing radiation.

3,856,646

METHODS AND ELECTRODES FOR THE DRYING OF DAMP BUILDINGS

Dinu Stefan Morarau, Str. Sibiel 1, Bucharest, Romania

Continuation-in-part of Ser. No. 744,162, July 11, 1968, abandoned. This application Oct. 20, 1972, Ser. No. 299,326
Claims priority, application Romania, Sept. 19, 1967, 54724
Int. Cl. B01d *13/02*
U.S. Cl. 204—180 R **23 Claims**



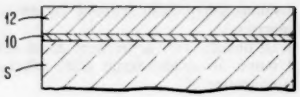
1. An active electro-dehumidification method for a damp structure, said method comprising embedding positive and negative electrodes in alternation in a wall of the structure in a damp region thereof which is to be dehumidified, forming the negative electrodes as hollow water-permeable members which can receive water externally thereof and convey the water for discharge outside said wall, and applying positive and negative charges to respective electrodes by connecting the electrodes to respective poles of a voltage source.

3,856,647

MULTI-LAYER CONTROL OR STRESS IN THIN FILMS

Arthur Gilbert Blachman, Briarcliff Manor, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 15, 1973, Ser. No. 360,693
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 **6 Claims**



1. In a method for achieving a minimum resistivity, minimum stressed conducting thin film comprising the steps of

sputter depositing a thin layer of a refractory metal on a substrate at a first voltage bias on said substrate, said voltage being selected to produce a multi-layer of minimum stress, and then

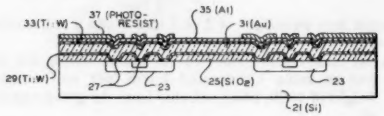
sputter depositing a thicker layer of another refractory metal over said first layer at a second voltage bias on said substrate different from said first voltage bias and corresponding to that bias voltage which produces a multi-layer of minimum resistivity.

3,856,648

METHOD OF FORMING CONTACT AND INTERCONNECT GEOMETRIES FOR SEMICONDUCTOR DEVICES AND INTEGRATED CIRCUITS

Clyde Rhea Fuller, Plano, and Prabhakar Bhimrao Ghate, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 19, 1973, Ser. No. 426,408
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 **15 Claims**



1. A method of forming interconnections on a semiconductor slice, comprising:

a. depositing a layer of Ti:W on said slice;

b. depositing over said layer a conductor metal having a high conductivity;

c. depositing over said conductor metal a second layer of Ti:W,

d. depositing over said layer of Ti:W a layer of aluminum;

e. photolithographically patterning and wet chemically etching said aluminum to leave an aluminum pattern representing the desired interconnection pattern on the slice;

f. removing the exposed portions of said second layer of Ti:W,

g. sputter etching the exposed portions of said conductor layer; and

h. removing the exposed portions of said first layer of Ti:W.

3,856,649

SOLID STATE ELECTRODE

Marvin Alden Genshaw, Elkhart, and Melvin Dee Smith, Mishawaka, both of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Mar. 16, 1973, Ser. No. 341,999

Int. Cl. G01n 27/30

U.S. Cl. 204—195 F 9 Claims

1. A solid state electrode for use in determination of ion concentration in an aqueous solution comprising, an electrically conductive inner element,

a salt having as a cation a cation form of at least a portion of said inner electrode material and also having an anion, said salt being disposed on a surface portion of said inner electrode,

a solid hydrophilic layer in intimate contact with said salt, said solid hydrophilic layer including polyvinyl alcohol and a water soluble salt of said anion, and

a solid hydrophobic layer in intimate contact with said solid hydrophilic layer shielding said solid hydrophilic layer from direct contact with the ion-containing aqueous solution when said electrode is immersed therein.

7. An electrode as described in claim 1 wherein an ion selective material is included in said hydrophobic layer.

3,856,650

CATHODE FOR AN ALUMINIUM FUSION ELECTROLYSIS CELL AND METHOD OF MAKING THE SAME

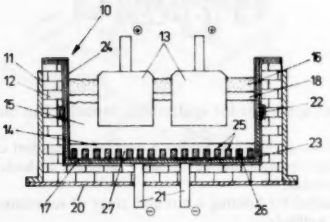
Tibor Kugler, Thayngen, and Hans Wolfhart Rieger, Berlingen, Switzerland, assignors to Swiss Aluminium, Ltd., Chippis, Switzerland

Filed Mar. 19, 1973, Ser. No. 342,450

Claims priority, application Switzerland, Mar. 21, 1972, 4295/72

Int. Cl. B01k 3/04

U.S. Cl. 204—243 R 13 Claims



1. A pot suitable for use as the cathode of an aluminum fusion electrolysis cell, comprising a heat insulating outer shell and, on the interior thereof, an inner chamber having walls of electrically conductive material, and an inner protective thin lining comprising compacted interfused particles strongly adhering to the inner surface of said chamber walls and adapted to be in contact with the melt, said lining being composed of a ceramic material which is electrically conductive and insoluble in a melt of fused cryolite and in molten aluminum.

3,856,651

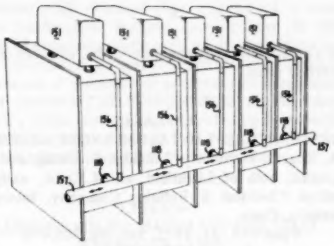
APPARATUS FOR PRODUCING UNIFORM ANOLYTE HEADS IN THE INDIVIDUAL CELLS OF A BIPOLAR ELECTROLYZER

Carl W. Raetzsch, and Hugh Cunningham, both of Corpus Christi, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 171,231, Aug. 12, 1971, Pat. No. 3,755,108, which is a continuation-in-part of Ser. No. 55,693, July 17, 1970,. This application May 16, 1973, Ser. No. 361,014

Int. Cl. B01k 3/10

U.S. Cl. 204—255 2 Claims



1. A bipolar electrolyzer comprising:

a plurality of individual electrolytic cells in series, each of said cells having an anolyte compartment and brine feed means, and said electrolyzer having an equalizer means independent of said brine feed means and comprising individual metal pipe means extending from openings in the anolyte compartments of the individual electrolytic cells to a common equalizer pipe means external the individual cells whereby to provide hydraulic communication between said anolyte compartments to maintain a substantially uniform head of anolyte in each of said cells.

3,856,652

ELECTROCHEMICAL CELLS

Martin Fleischmann, Eastleigh; Christopher John Hall King, Newcastle-upon-Tyne; John Wilfred Oldfield, Sutton Coldfield; Raymond Ernest Plimley, Newcastle-upon-Tyne, and Charles Lionel Kasturiratne Tennakoon, Kalagedihena, all of England, assignors to National Research Development Corporation, London, England

Filed Dec. 26, 1972, Ser. No. 318,463

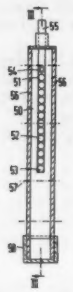
Claims priority, application Great Britain, Dec. 30, 1971, 60763/71

Int. Cl. B01k 3/04; C01b 7/06

U.S. Cl. 204—268 17 Claims

1. A multi-bipolar electrode cell adapted for operation with flowing electrolyte, comprising a plurality of bipolar electrode units, or groups of bipolar electrode units, said bipolar electrode units or groups of bipolar electrode units being arranged, in operation, to be electrically in series in spaced relationship from one end of the electrode system to the other, series connections being provided, in operation of the cell, between the adjacent electrode units or groups of electrode

units by flowing electrolyte substantially uniformly bridging the gaps between them, comparatively thin films of electrolyte



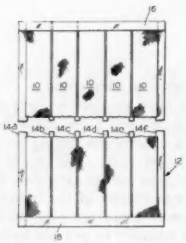
being in contact with the remainder of the surfaces of individual electrode units.

3,856,653

PLATINUM CLAD TANTALUM ANODE ASSEMBLY

Orris A. Rogers, Woodbury; Eldridge K. Camp, and John P. Borgmann, both of Litchfield, all of Conn., assignors to American Chemical & Refining Company, Incorporated, Waterbury, Conn.

Filed Nov. 21, 1972, Ser. No. 308,478
Int. Cl. C23b *5/72, 5/58*
U.S. Cl. 204—286 **9 Claims**



1. A platinum-clad tantalum anode assembly comprising:

a relatively flexible tantalum mesh having platinum cladding on only one surface thereof and a tantalum surface;

a relatively rigid framework disposed adjacent the tantalum surface of said tantalum mesh and extending about the margins of said mesh, said framework including a plurality of elongated frame members and transverse frame members extending perpendicularly thereto at the ends thereof, said said frame members being fabricated of tantalum and said tantalum surface of said mesh being bonded to said elongated frame members to provide electrical connection therebetween resistant to corrosive action by a bath in which the assembly may be disposed, said frame members extending generally parallel to the plane of said mesh, and

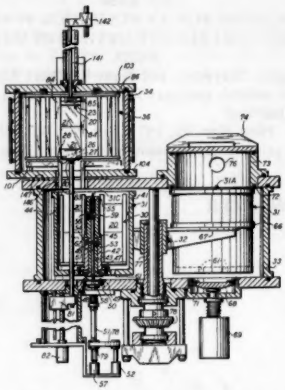
a relatively rigid current distribution subassembly comprising at least one elongated bus member extending in generally parallel relationship to said elongated frame members and to the plane of said mesh, said distribution subassembly further comprising at least one transverse bus member extending generally perpendicular to said elongated bus member and disposed intermediate the ends of said elongated frame members and extending therebetween, said transverse bus member being bonded on one surface thereof to said elongated bus member and on the other surface thereof to the surface of said elongated frame members spaced from said mesh to provide electrical connection therebetween resistant to corrosive action by a bath in which the assembly may be disposed, said bus members of said subassembly being free from electrical contact with said framework and said mesh except through the conductive paths provided by said bonds between the transverse bus member and the elongated frame members intermediate the length of said elongated frame members for distribution of electrical current to said framework and to said tantalum mesh from points spaced intermediate the length of said conductive framework.

3,856,654

APPARATUS FOR FEEDING AND COATING MASSES OF WORKPIECES IN A CONTROLLED ATMOSPHERE

Carroll H. George, North Andover, Mass., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Aug. 26, 1971, Ser. No. 175,247
Int. Cl. C23c *15/00*
U.S. Cl. 204—298 **14 Claims**



1. In an apparatus for sputtering a metallic film onto substrates:

a sputtering chamber having a centrally disposed cathode for sputtering a film of the material of the cathode on the substrates;

a carrousel for holding a circular array of substrates about said cathode;

means for indexing the carrousel to move the substrates in a circular path about the cathode;

said chamber having a slot formed therein in tangential relation to the circular path of movement of the substrates;

a magazine carrier for holding a radial array of substrates;

means for intermittently rotating said magazine carrier to move each substrate into alignment with said slot;

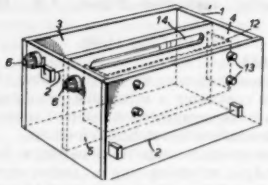
means for moving an aligned substrate through said slot into said carrousel following each intermittent rotation of said magazine carrier and then for removing a film coated substrate from the carrousel and returning the substrate to the magazine carrier; and

means including a housing surrounding said magazine carrier for maintaining a vacuum about the substrates during movement to and from the sputtering chamber.

3,856,655
VERTICAL GEL ELECTROPHORESIS APPARATUS

Peter Clive Buckley Roberts, Buenos Aires, Argentina, assignor to Bovril Limited, Enfield, Middlesex, England

Filed Jan. 15, 1973, Ser. No. 323,426
Int. Cl. B01d 13/02
U.S. Cl. 204—299 3 Claims

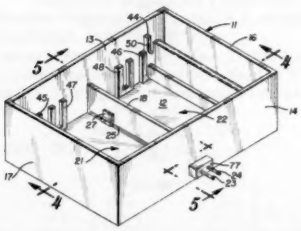


1. Vertical gel electrophoresis apparatus comprising a rectangular buffer tank divided into a first compartment and a second compartment by a vertical partition extending upwardly from the base of the tank and wholly across the tank in a plane parallel to two opposite side walls thereof, the first compartment containing a lower buffer tank in which is vertically disposed a gel cell, the lower surface of the gel cell being directly contactable over its whole area with a buffer solution containable within the lower buffer tank, and an upper buffer tank defined by four walls, one of the four walls being a portion of the partition, and at least part of the bottom of which upper buffer tank is defined by the upper surface of the gel cell, means for allowing a buffer solution in the second compartment to overflow into the upper buffer tank and, disposed in each compartment, an electrode for establishing a potential across the gel cell.

3,856,656
ELECTROHORETIC APPARATUS

Miless L. Brink, 1050 Halland St., Lakewood, Colo. 80215

Filed June 18, 1973, Ser. No. 370,910
Int. Cl. B01k 5/00
U.S. Cl. 204—299 9 Claims



1. Apparatus useful in connection with electrophoresis studies comprising an upwardly opening cell structure having liquid-tight end and side walls, a liquid-tight intermediate wall for said cell structure dividing a lower portion of the cell structure into separate receptacles adapted to receive an electrolyte-buffer solution, separate electrodes in each of said receptacles in position for contact with said buffer solution, support partitions that are of operative height greater than the height for said intermediate wall for disposition in each of said receptacles, a carrier structure having a specimen receiving surface on a lower or inverted face of said carrier disposed for support by and extension between the support partitions in the separate receptacles, said specimen receiving surface accordingly being disposed across and above said intermediate wall, said carrier structure further having edge elements extending downwardly at all sides of said specimen receiving surface for the protection of said specimen receiving surface and said support partitions providing slots for the accommodation of said downwardly extending edge elements, wick elements of a type to be wetted by the buffer solution on each of said support partitions and in wetted contact with the buffer solution and the specimen receiving surface of said carrier whereby electrical current may be delivered to the specimen receiving surface, and a power source for selective connection to said electrodes to provide said electric current.

3,856,657
OXIDIZED PETROLEUM PITCH

Marc Michael Seinfeld, 5 Morningside Dr., Succasunna, N.J. 07876, and George Alexander Shedyak, 2 Pender Pl., Fords, N.J. 08863

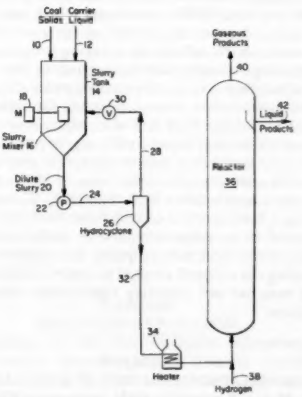
Filed Feb. 11, 1974, Ser. No. 441,093
Int. Cl. C10c 3/04
U.S. Cl. 208—6 7 Claims

1. A binder pitch obtained from a feedstock of aromatic petroleum hydrocarbon bottoms derived from the thermal processing of petroleum hydrocarbons, by the batchwise oxidation-polymerization of said aromatic petroleum feedstock in the presence of a residue of previously oxidized aromatic petroleum feedstock, at a temperature in the range of 680°–750°F., while passing a source of oxygen through said feedstock at the rate of about 0.01 to 0.2 cu.ft./min. oxygen/bbl., at substantially atmospheric pressure.

3,856,658
SLURRIED SOLIDS HANDLING FOR COAL HYDROGENATION

Ronald H. Wolk, Trenton, and Michael C. Chervenak, Pennington, both of N.J., assignors to Hydrocarbon Research Inc., New York, N.Y.

Continuation-in-part of Ser. No. 191,035, Oct. 20, 1971, abandoned. This application Oct. 9, 1973, Ser. No. 404,281
Int. Cl. C10g 1/06
U.S. Cl. 208—10 10 Claims



1. A method for introducing particulate coal in liquid phase slurry form into a high pressure reaction zone which comprises:

a. mixing said particulate coal with a hydrocarbon liquid to produce a dilute slurry;

b. pressurizing said dilute slurry to a pressure above the reaction zone pressure;

c. passing said pressurized slurry through liquid-solid centrifugal type separator means without substantial loss of pressure to produce a clarified liquid portion and a concentrated slurry portion;

d. returning the clarified liquid portion from (c) through pressure reducing means to the mixing step (a); and

e. passing the concentrated slurry portion of (c) to the high pressure reaction zone.

3,856,659

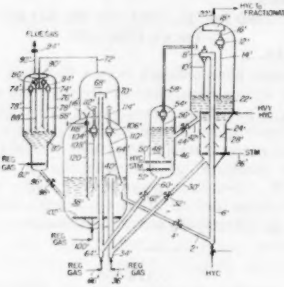
MULTIPLE REACTOR FCC SYSTEM RELYING UPON A DUAL CRACKING CATALYST COMPOSITION

Hartley Owen, Belle Mead, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 19, 1972, Ser. No. 316,624

Int. Cl. C10g *11/04, 11/18;* **C01b** *33/28*

U.S. Cl. 208—80 **9 Claims**



1. A method for converting hydrocarbons to gasoline product with a dual component cracking catalyst comprising a large pore cracking component in combination with a ZSM-5 type of crystalline alumino-silicate which comprises passing a suspension comprising a gas oil feed boiling above 450°F. in admixture with said dual component cracking catalyst upwardly through a riser reactor at a temperature in the range of 1,000°F. up to 1,400°F., introducing a high coke producing oil feed into a downstream portion of said riser under conditions to substantially subdue the cracking activity of the large pore crystalline alumino-silicate, separating the suspension into a hydrocarbon phase and a catalyst phase, recovering the separated hydrocarbon phase, collecting the separated catalyst phase as a dense fluid bed of catalyst, beneath the riser conversion outlet, combining freshly regenerated catalyst with said collected dense fluid bed of catalyst to provide a bed of catalyst with a temperature in the range of 800°F. to 1,200°F., introducing a hydrocarbon feed comprising C_3 and C_4 hydrocarbons to a lower portion of said dense fluid bed for cyclization thereof to aromatic components, withdrawing catalyst from said dense fluid bed, stripping the withdrawn catalyst, regenerating the stripped catalyst to remove deposited carbonaceous material and returning regenerated catalyst to said riser reactor.

3,856,660

REFORMING PROCESS USING Pt-Ir-Ga CATALYST

John W. Myers, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 190,288, Oct. 18, 1971, Pat. No. 3,789,024. This application Aug. 15, 1973, Ser. No. 388,599

Int. Cl. C10g *35/06*

U.S. Cl. 208—138 **5 Claims**

1. A process for the catalytic reforming of hydrocarbons which comprises contacting at reforming conditions naphtha and hydrogen with a catalyst having increased activity and selectivity comprising a refractory support promoted with from about 0.01–5 weight percent of platinum, iridium and gallium, respectively, and withdrawing a reformate rich in aromatics.

3,856,661

REFORMING USING HOMOGENEOUS PLATINUM-IRIDIUM CATALYST

Andre Sugier, Rueil Malmaison, and Jean Miquel, Paris, both of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil Malmaison, France

Division of Ser. No. 115,852, Feb. 16, 1971, Pat. No. 3,761,428. This application Sept. 21, 1973, Ser. No. 399,502

Claims priority, application France, Feb. 23, 1970, 70.06454

Int. Cl. C10g *35/06*

U.S. Cl. 208—138 **8 Claims**

1. In a process of increasing the octane number of a hydrocarbon mixture containing a substantial percentage of aliphatic hydrocarbons, comprising the step of subjecting said mixture of hydrocarbons to catalytic reforming,

the improvement which comprises employing as the catalyst in the catalytic reforming step a catalyst comprising a carrier, from 0.005 to 1% of platinum and from 0.005 to 1% of iridium by weight with respect to the carrier,

wherein:

the distribution of platinum and iridium on the carrier is substantially homogenous, said distribution of platinum and iridium, determined with the Castaing microanalyser, being such that, C_1 and C_2 being respectively the average concentrations of platinum and iridium on the carrier, the concentrations of platinum and iridium at any point of the carrier are in the range of from 0.5 C_1 to 2 C_1 and from 0.5 C_2 to 2 C_2, respectively.

3,856,662

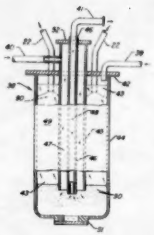
METHOD FOR SOLIDS-WITHDRAWAL AND TRANSPORT FROM A SUPERATMOSPHERIC PRESSURE SYSTEM

Arthur R. Greenwood, Niles, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 347,583, April 2, 1973,. This application Dec. 10, 1973, Ser. No. 423,605

Int. Cl. C10g *13/16*

U.S. Cl. 208—171 **4 Claims**



1. A method for withdrawing and transporting a relatively uniform quantity of hydrocarbon conversion catalyst particles, substantially free from hydrocarbons, from a reaction zone containing a bed of said particles movable therethrough by gravity-flow, which method comprises the steps of:

a. withdrawing catalyst particles from said zone, through a plurality of conduits (i) in open communication with said bed, and (ii) substantially equally spaced through-out the cross-sectional area thereof;

b. introducing said catalyst particles, via said conduits, into an upper portion of a withdrawal and transport vessel having a plurality of vertical, peripheral catalyst-holding sections (i) of substantially equal volume, and (ii) equal in number to said conduits, one conduit discharging catalyst particles into one of said sections;

c. simultaneously and continuously introducing a first fluid purge stream into said vessel, and flowing said purge stream countercurrently through said conduits, at a linear

velocity below that which effects fluidization of said catalyst particles, to strip hydrocarbons therefrom, while permitting free gravity-flow of the particles through said conduits;

d. when the quantity of catalyst particles in each catalyst-holding section contacts the lower extremity of each conduit, automatically terminating the flow of particles into each section, introducing a second fluid lift stream downwardly into an annulus formed by imperforate, concentric first and second centerpipes, at a velocity sufficient to lift said catalyst particles from the bottom of said vessel upwardly through the inner concentric centerpipe, and removing said catalyst particles and gaseous lift stream from said vessel;

e. simultaneously with the introduction of said fluid lift stream, and the removal of said particles, increasing the velocity of said purge stream to a level inhibiting the flow of catalyst particles downwardly through said conduits, said increased level being below that causing a reversal of catalyst flow in said conduits; and,

f. after said catalyst particles have been removed from said vessel, terminating the flow of said fluid lift stream and decreasing the velocity of said fluid purge stream to a level permitting the flow of catalyst particles through said conduits.

3,856,663

OXYGEN-PROMOTED THERMAL HYDROCARBON CONVERSION PROCESSES

Gilford A. Chappell, Colonia, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed July 5, 1973, Ser. No. 376,622

Int. Cl. C10c *23/00*

U.S. Cl. 208—209 **23 Claims**

1. In a process for thermally hydrotreating a hydrocarbon feed by contacting said hydrocarbon feed with hydrogen under thermal hydrotreating reaction conditions the improvement which comprises effecting the hydrotreating in the presence of an effective amount of oxygen thereby promoting the hydrotreating process.

3,856,664

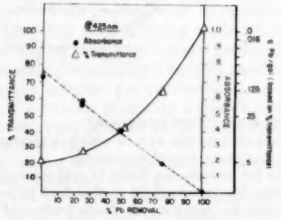
SORBENT FOR HEAVY METALS

Darrell Duayne Whitehurst, Titusville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 319,098, Dec. 27, 1972, abandoned, which is a continuation-in-part of Ser. No. 270,913, July 12, 1972, Pat. No. 3,785,968. This application Feb. 21, 1974, Ser. No. 444,610

Int. Cl. C10g *17/00*

U.S. Cl. 208—253 **9 Claims**



1. A method for effecting removal of heavy metal contaminant from a substantially hydrocarbon solution containing the same which comprises contacting said solution with a sorbent comprising a porous solid selected from the group consisting of cross-linked polystyrene, and inorganic oxides, for said metal contaminant in a flowing system said sorbent comprising a substrate having a minimum surface area of about 10 m^2/g and pores with a minimum pore diameter of about 10A modified by sulfur having weak Lewis base character, the available electrons which produce the Lewis base character being available from the sulfur atom.

3,856,665

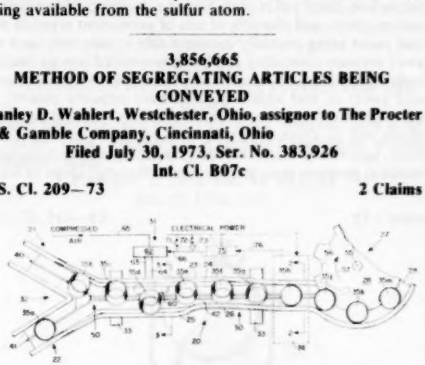
METHOD OF SEGREGATING ARTICLES BEING CONVEYED

Stanley D. Wahlert, Westchester, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed July 30, 1973, Ser. No. 383,926

Int. Cl. B07c

U.S. Cl. 209—73 **2 Claims**



1. A method of segregating a conveyed file of articles into a first sub-file consisting of unacceptable said articles having dynamic response characteristics outside an acceptable range, and a second sub-file consisting of acceptable articles having dynamic response characteristics within the acceptable range, said method comprising the steps of:

conveying said file of articles on a first conveyor having a portion thereof in side-by-sdie relation with a portion of a second conveyor;

inspecting and identifying each article as being acceptable or unacceptable;

tipping every article of said file to a stable predetermined first orientation so that the entire file is conveyed on said first conveyor for a part of the length of said side-by-side portions of said conveyors; and,

acting on each acceptable article to remove each acceptable article from said first conveyor to said second conveyor, said acting comprising tilting said acceptable articles to a stable predetermined second orientation by interposing a cam in the path of said file of articles disposed at said first orientation, said tilting causing said acceptable articles to lose contact with said first conveyor and to become disposed on said second conveyor,

whereby the unacceptable articles remaining on said first conveyor form said first sub-file which is thence forwarded on said first conveyor, and said acceptable articles form said second sub-file which is thence forwarded on said conveyor, said first sub-file consisting of said unacceptable articles disposed at said first orientation, and said second sub-file consisting of said acceptable articles disposed at said second orientation.

3,856,666

MAGNETIC SEPARATOR

Saburo Yashima, No. 20, Aza-Nikenjaya, Minamime, Haramachi, Sendai; Haruo Manabe, Hitachi; Takuma Ito, Saitama, and Keishi Namikawa, Ageo, all of Japan, assignors to Saburo Yashima and Nippon Mining Co., Ltd., both of Tokyo, Japan

Filed July 20, 1972, Ser. No. 273,580

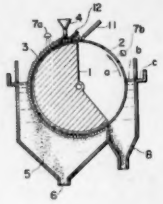
Claims priority, application Japan, July 20, 1971, 46-53565; July 20, 1971, 46-53566; July 28, 1971, 46-56031; Jan. 11, 1972, 47-4986

Int. Cl. B03c *1/12*

U.S. Cl. 209—219 **9 Claims**

1. A wet type magnetic separator for separating magnetic particles from raw material particles, said separator comprising a generally cylindrical stationary magnet device in the form of a cylindrical body having a cut away recess opening from the top of the cylindrical body to one side along its

periphery and having an axis which is fixed substantially horizontally, said cylindrical body consisting of a plurality of sets of multiple discal permanent magnets each having a cut away recess and discal yokes each having a similar configuration to said magnets, said plurality of sets of permanent magnets and said yokes being coaxially mounted side by side with their cut away recesses coinciding and being assembled into an integral body with the sets of permanent magnets sandwiched between said yokes so that adjacent yokes have opposite polarity to each other, rotary drum disposed coaxially with and rotatable about and in close proximity to said stationary cylindrical body, said rotary drum including axially spaced nonmagnetic material portions separated by circumferential strips of material of high magnetic permeability, said strips being in alignment respectively with said yokes and forming low reluctance paths for the magnetic field across the gap between the drum and said cylindrical body and defining a first group of induced poles, and a single continuous layer of induced poles provided on the immediate outer periphery of said drum overlying said first group of induced poles and forming a second group of induced poles spanning the complete length and the periphery of the drum opposite at least the non-cut away portion of said cylindrical body; whereby, said magnetic particles are effectively separated from the nonmagnetic particles contained within raw material particles directed onto the rotary drum periphery during rotation thereof.



3,856,667

MICROBIAL DEGRADATION OF PETROLEUM

Edward N. Azarowicz, Vienna, Va., assignor to Bioteknika International, Inc., Alexandria, Va.

Continuation-in-part of Ser. No. 43,226, June 3, 1970, Pat. No. 3,769,164. This application Dec. 11, 1972, Ser. No. 313,629The portion of the term of this patent subsequent to Oct. 30, 1970, has been disclaimed.

Int. Cl. C02b *9/02*

U.S. Cl. 210—11 **10 Claims**

1. A process for the microbial degradation of aqueous polluting petroleum and oily wastes which comprises treating the petroleum or oily waste with at least one microorganism selected from the group consisting of *Candida lipolytica* 2005 ATCC 20255, *Candida lipolytica* 2002 ATCC 20362, *Candida lipolytica* 2003 ATCC 20363, and *Candida lipolytica* 2004 ATCC 20364, and mutants thereof in an aqueous system for a sufficient time until the treated petroleum oily waste has been substantially degraded.

3,856,668

METHOD FOR TREATMENT OF COAL WASHERY WATERS

Roland H. Shubert, 11530 Hickory Cluster, Reston, Va. 22090

Filed May 30, 1973, Ser. No. 365,202

Int. Cl. B01d *11/00*

U.S. Cl. 210—21 **12 Claims**

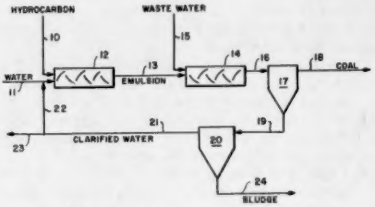
1. A method for treating a water slurry containing in suspension very finely divided coal particles and particulate inorganic materials associated with coal which comprises:

mixing with said water slurry a heavy, liquid hydrocarbon in aqueous emulsion, wherein the amount of hydrocarbon added to the waste stream is in the range of 2 to 10% by weight based upon the weight of coal particles contained in the waste stream, said hydrocarbon being chosen from the group consisting of heavy fuel oils, waste lube oils and coal tar, said mixing being accomplished by subjecting the slurry and emulsified hydrocarbon to agitation sufficiently intense to disperse the hydrocarbon on the surface of the coal particles and to cause collisions between coal particles resulting in the formation of coal agglomerates;

passing the slurry, now containg coal agglomerates and finely divided inorganic matter in suspension, to a first separation zone wherein coal agglomerates are removed;

passing the water fraction containing suspended inorganic matter to a second separation zone, and

recovering from the second separation zone a clarified water fraction.



3,856,669

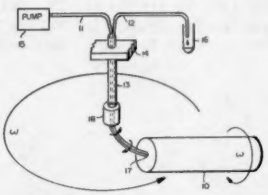
ELUTION CENTRIFUGE-APPARATUS AND METHOD

Yoichiro Ito, and Robert L. Bowman, both of Bethesda, Md., assignors to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed July 2, 1973, Ser. No. 375,882

Int. Cl. B01d *15/08*

U.S. Cl. 210—31 C **9 Claims**



1. An elution centrifuge comprising:

a separation column the axis of which is generally perpendicular to a main axis of revolution;

a feed tube for introducing fluids to said separation column and means for passing fluid to said feed tube;

a return tube for discharging fluids from said separation column and means for receiving fluid therefrom;

centrifugation means for revolving said separation column about the main axis of revolution and for simultaneously rotating said separation column about its axis at the same angular velocity to prevent twisting of said feed and return tubes; and

a stationary guide means, located outside said centrifugation means coaxial with the main axis of revolution, for guiding said feed and return tubes.

3,856,670

REMOVAL OF BORON FROM WATER

Willard D. Peterson, Pasadena, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation of Ser. No. 74,877, Sept. 23, 1970, abandoned. This application Jan. 31, 1972, Ser. No. 222,385
Int. Cl. B01d *15/04*
U.S. Cl. 210—32 14 Claims

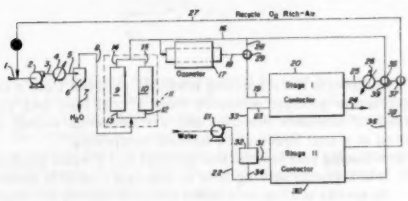
1. A process for the removal of boron values from aqueous solutions having borate ions contained therein comprising contacting the aqueous solution containing borate ions with a water insoluble solid organic ion exchange resin, which resin is produced by the co-condensation of an aromatic ortho-hydroxy carboxylic acid, a phenolic compound and an aldehyde to selectively absorb the boron value onto the resin in the presence of at least one cationic species selected from the group consisting of alkali, alkaline earth, nitrogen organic bases and ammonium cations.

3,856,671

CLOSED-LOOP OZONE GENERATING AND CONTACTING SYSTEM

Hanju Lee, Columbia, and Harvey Milton Rosen, Laurel, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 204,503, Dec. 3, 1971, Pat. No. 3,748,262. This application Nov. 21, 1972, Ser. No. 308,612The portion of the term of this patent subsequent to July 24, 1990, has been disclaimed.
Int. Cl. C02b *1/38*
U.S. Cl. 210—63 23 Claims



1. A closed-loop water treatment process using an oxidizing gas comprising:

a. flowing at least one portion of an oxygen enriched gas to an ozonator wherein from about 1 to 7 percent ozone is formed; said oxygen enriched gas being the product of a pressure-swing fractionator;

b. flowing the oxygen enriched gas containing ozone to a first gas-liquid contactor;

c. flowing a partially purified water to be treated with said oxygen enriched gas containing ozone to said first gas-liquid contactor from an additional gas-liquid contactor;

d. thoroughly contacting said partially purified water and said oxygen enriched gas containing ozone in said first gas-liquid contactor producing a treated water which is substantially purified and a gas at least partially depleted of ozone and oxygen;

e. flowing impure water from an inlet to said additional gas-liquid contactor;

f. flowing said gas at least partially depleted of ozone and oxygen to said additional gas-liquid contactor for thorough contacting with said impure water, partially purifying said impure water, and said gas at least partially depleted of ozone and oxygen is further depleted in at least one component;

g. flowing said gas further depleted in at least one component from said additional gas-liquid contactor as a recycle gas and comixing said recycle gas with a portion of air;

h. flowing the comixture of air and recycle gas through a pressure-swing fractionator wherein nitrogen is selectively removed, thereby yielding an oxygen enriched gas; and

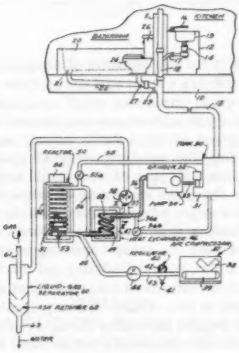
i. repeating step (a), thereby producing a closed-loop water treatment system.

3,856,672

CONTINUOUS WET OXIDATION SYSTEM FOR THE HOME

George Boswinkle, and Robert Bradford Wheaton, both of St. Joseph, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 4, 1972, Ser. No. 312,194
Int. Cl. C02c *5/06*
U.S. Cl. 210—63 11 Claims



1. The method of handling waste, organic trash and garbage in a home, which includes the steps of:

flushing garbage disposers, toilets and other household appliances for receiving and gathering organic refuse, garbage and trash through a common hydraulic system formed by suitable plumbing means, thereby to collect the waste generated in the home as flushed material containing solid and liquid contents;

at one point in the system collecting the flushed material into a common receiving tank;

macerating and mixing the solid and liquid contents of the tank to form an influent which can be circulated through the system;

at a second point in the system metering a supply of pressurized air to support oxidation of the influent;

at a third point in the system pressurizing the influent by pumping to drive the influent in the form of a stream;

at a fourth point in the system confining the stream together with the air supplied thereto to flow through a heat transfer coil of substantial length and numerous loops in a reacting zone while adding radiant electrical thermal energy to the stream through the coil throughout the entire effective flow path length of the coil within the reacting zone such that a temperature in the order of 550°– 560° F. is maintained throughout travel of the stream through the coil in the reacting zone and thereby oxidizing the solids during the residence of the stream in the reacting zone and forming a completely oxidized effluent within the reacting zone;

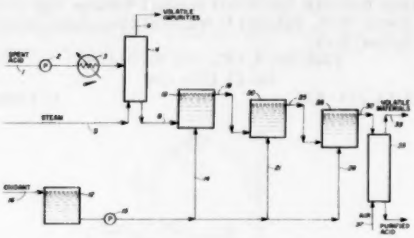
and separating effluent leaving the reacting zone into harmless gas, sterile residual ash and clarified water.

3,856,673

PURIFICATION OF SPENT SULFURIC ACID

George B. De La Mater, Media, and Barton Milligan, Ardmore, both of Pa., assignors to Air Products and Chemical, Inc., Wayne, Pa.

Filed Apr. 2, 1973, Ser. No. 347,219
Int. Cl. C02b 1/36
U.S. Cl. 210—63 6 Claims



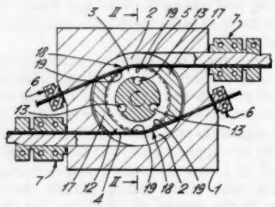
1. In a system for the nitration of aromatic compounds, a process for purifiying a spent acid stream from said system and containing organic impurities which comprises the steps of stripping said spent acid stream in a denitrifier to remove a substantial portion of the volatile organic impurities therefrom, contacting the resulting stripped spent acid stream containing at least 50 ppm of nonvolatile organic impurities selected from the group consisting of nitrocresols and other nitrophenolic compounds and from 60% to about 85% by weight of sulfuric acid from said denitrifier with an oxidizing agent selected from the group consisting of ozone, hydrogen peroxide, chlorates, peroxydisulfates and mixtures thereof by adding at least one stoichiometric equivalent in increments of about one-third or less of said oxidizing agent per equivalent of nonvolatile organic impurities during a period of about one minute to about 60 minutes at a temperature of about 130° to 230°C and recovering a purified acid stream containg less than 50 weight of said nonvolatile organic impurities than said stripped spent acid stream.

3,856,674

FILTERING PROCESS AND APPARATUS

Peter Gabor Kalman, 51 Compayne Gardens, London, England

Filed Mar. 23, 1973, Ser. No. 344,414
Int. Cl. B01d 35/13
U.S. Cl. 210—71 119 Claims



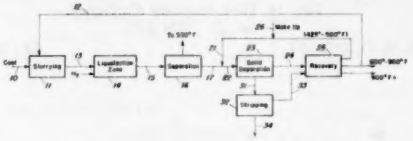
1. A process for filtering a substance flowing through a passage comprising the steps of introducing a filter by passing it through inlet and outlet ports flanking said passage so that a part of the filter extends across the passage, forcing the substance through the filter part in the passage to filter the substance, providing a flowable sealing substance in said inlet and outlet ports, maintaining temperature conditions at said inlet and outlet ports resulting in the formation therein of sealing plugs of said flowable sealing substance of adequate rigidity to prevent substantial leakage at said ports of the substance being filtered, supporting at least said part of the filter which extends across the passage by means of a movable backing support adapted to receive substance filtering through the filter, equalizing the force applied to the backing support as the result of a hydrostatic pressure differential across the filter urging the filter against the backing support by applying to the backing support a counteracting force thereby at least to reduce the net force tending to restrict the ease of movement of the backing support, effecting movement of said filter through said ports to introduce another part thereof into said passage under conditions providing for maintenance of the said sealing plugs, effecting movement of said backing support with said filter movement so that the backing support serves as a moving bearing for the filter, and extracting said filtered material received in the backing support.

3,856,675

COAL LIQUEFACTION

Morgan C. Sze, Upper Montclair, and George J. Snell, Fords, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Nov. 7, 1972, Ser. No. 304,319
Int. Cl. C10g 1/00
U.S. Cl. 210—73 31 Claims



1. A process for separating insoluble material from a coal liquefaction product produced from a coal feed and comprised of insoluble material and carbonaceous matter dissolved in a coal liquefaction solvent, comprising:

introducing said liquefaction product and a liquid promoter into a gravity settling zone to separate insoluble material by gravity settling, said liquid promoter having a 5 volume percent distillation temperature of at least about 250° F. and a 95 volume percent distillation temperature of at least about 350° F. and no greater than about 750° F., said liquid having a characterization factor (K) of at least 9.75;

said liquid having a characterization factor greater than said coal liquefaction solvent;

said promoter liquid being added in an amount sufficient to promote and enhance gravity settling of insoluble material to produce an overflow essentially free of insoluble material; and

recovering from the settling zone a liquid overflow essentially free of insoluble material and a liquid underflow containing the insoluble material.

3,856,676

WATER PURIFICATION AND VENDING APPARATUS

Henry L. Grimme, Jr., Parkville, Mo., and Ray Osborn, Overland Park, Kans., assignors to Raypak, Inc., Westlake Village, Calif.

Filed Apr. 3, 1972, Ser. No. 240,535
Int. Cl. B01d 31/00
U.S. Cl. 210—96 7 Claims

1. A vending apparatus for dispensing water comprising:

a. a housing having at least one dispensing station accessible from the exterior thereof;

b. a closed treated water tank in the housing;

c. a water treating means including a semipermeable membrane filtration structure operating under pressure to pass filtered water and reject impurites including solids and

dissolved minerals, said treating means having a filtered water outlet in flow communication with the treated water tank for delivery of filtered water thereto;

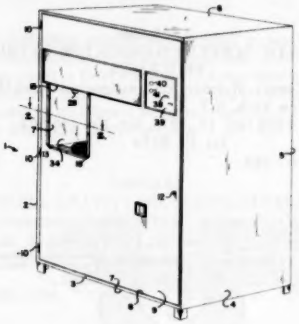
d. means connecting said membrane filtration structure to a disposal for transmittal of rejected water thereto;

e. a flow line having an inlet connected to a source of raw water;

f. a pump having an inlet connected to said flow line and an outlet connected to the water treating means to deliver raw water to the upstream side of said membrane filtration structure for treatment therein;

g. a dispensing means for dispensing water at said dispensing station;

h. means connecting the treated water tank to said dispensing means to transmit treated water from said tank to said dispensing means for dispensing;



i. a coin operated means supported by said housing operative to control said dispensing means and effect delivery of a predetermined quantity of treated water in response to deposition of a coin of proper value;

j. a carbon fiter between the treated water tank and said dispensing means and arranged whereby all water dispensed passes therethrough;

k. means for detecting the purity of the treated water from the water treating means and operative for deactivating from dispensing means when impurities in the treated water exceed a predetermined level;

l. a prefilter in said flow line upstream from said pump and operative to remove particles of solids from the raw water; and

m. means responsive to differential pressure around said prefilter and operative to deactivate the dispensing means and pump if flow through the prefilter is retarded to a predetermined minimum.

3,856,677

PROPORTIONAL CHEMICAL INJECTION SYSTEM

Beldon A. Peters, Houston; Louis P. Smith, Webster, and Aubrey O. Landrum, Houston, all of Tex., assignors to Esso Production Research Company, Houston, Tex.

Filed Dec. 18, 1972, Ser. No. 316,338
Int. Cl. B01d *17/04*
U.S. Cl. 210—96 **17 Claims**

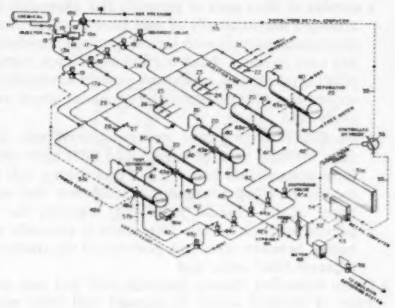
1. A system for treating an emulsified mixture of oil and water which comprises:

at least one separator means adapted to be connected to and contain a supply of said mixture;

said separator means being provided with separate means to discharge separately gas, free water, and an emulsion of oil and water;

means connected to said separator means for injecting a selected amount of demulsifying agent into said mixture in said separator means;

means connected to said emulsion discharge means for generating and transmitting first or second signals which are, respectively, proportional to the amount of water in the emulsion or the gross amount of said emulsion discharged from said vessel when the percentage of water in said emulsion discharged from said vessel exceeds a predetermined percent;



an electrical circuit connected electrically to said generating and transmitting means and injection means; and

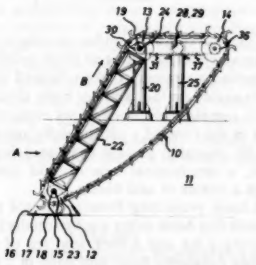
switch means in said electrical circuit operable when the percentage of water in said emulsion exceeds said predetermined percent to close said electrical circuit means and thereby conduct said first or second signals to said injection means for injecting said selected amount of demulsifying agent.

3,856,678

SELF-RECONDITIONING FILTER APPARATUS FOR CONTINUOUS REMOVAL OF SOLIDS FROM A STREAM OF LIQUID

Tadashi Hagihara, 4-1, 5-chome, Minami Nagasaki, Toshima-ku, Tokyo, Japan

Filed Jan. 17, 1974, Ser. No. 434,113
Int. Cl. B01d *33/04*
U.S. Cl. 210—160 **5 Claims**



1. A self-reconditioning filter apparatus for continuous removal of solids from a liquid flowing through a channel of given width and depth, comprising in combination:

a shaft rotatably supported across said channel adjacent the bottom thereof;

a first pair of toothed wheels fixedly mounted on said shaft adjacent both ends thereof respectively;

at least one other shaft rotatably supported across said channel above the level of the liquid flowing therethrough, said one other shaft being located on the downstream side of the first mentioned shaft;

a second pair of toothed wheels fixedly mounted on said one other shaft adjacent both ends thereof respectively;

drive means for imparting rotation at least to said second pair of toothed wheels;

a filter medium in the form of an endless belt adapted to operate at least over said first and second pairs of toothed wheels in engagement therewith, said filter medium including:

a number of filter units of generally flat, elongated shape arranged longitudinally of said filter medium in a discontinuous manner with lateral spacings therebetween and each having a shank portion and a hook portion in offset arrangement, said shank portion having first and second bores formed through both ends thereof respectively; and

a plurality of linking rods arranged transversely of said filter medium to interconnect said filter units into the form of an endless belt, each of said linking rods being loosely received alternately in said first and second bores of the adjacent filter units whereby the hook portion of each of said filter units is normally partly buried between the shank portions of the transversely adjacent filter units; and

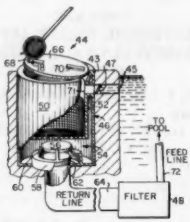
a frame extending linearly between said first and second pairs of toothed wheels to support said filter medium against the force of the liquid flowing therethrough.

3,856,679

POOL SKIMMER NET

Richard L. Jackson, 70 Andrew Ford Way, Abington, Mass. 02351

Filed Nov. 12, 1973, Ser. No. 414,947
Int. Cl. E04h *3/20*
U.S. Cl. 210—169 **6 Claims**



1. A tool and net combination for cleaning a swimming pool skimmer, the skimmer including an open ended body in which there is mounted a strainer, a cover formed with an opening is removably seated on the skimmer body about the open end thereof, said combination tool and net comprising:

a. a head in the form of a substantially annular member;

b. a handle mounted to said head at a rearward portion thereof, a longitudinal axis of said handle extending through a center of said head;

c. a first hook projecting from a forward portion of said head, said first hook being a substantially L-shaped member having a leg and a foot, said leg of said first hook extending outwardly from said head in a plane that is in substantially parallel relationship with a plane in which said handle lies, said foot of said first hook extending downwardly from said leg of said first hook in a plane that is in substantially perpendicular relationship with the plane in which said handle lies;

d. a second hook projecting from a forward portion of said head, said second hook being a substantially L-shaped member having a leg and a foot, said leg of said second hook extending outwardly from said head in a plane that is in substantially parallel relationship with the plane in which said handle lies, said foot of said second hook extending downwardly from said leg of said second hook in a plane that is in substantially perpendicular relationship with the plane in which said handle lies;

e. a net mounted to said head, said net having an open end and a closed end, said open end coinciding with and secured to said head;

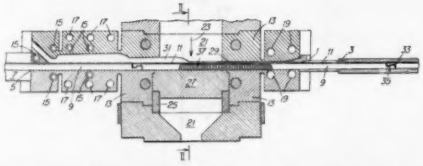
f. said first hook disposed at one side of the longitudinal axis of said handle and said second hook disposed at the other side of the longitudinal axis of said handle, a longitudinal axis of said foot of said first hook and a longitudinal axis of said foot of said second hook diverging toward the center of said head, the width of said first hook being substantially wider than the width of said second hook, said first hook operative to engage the opening formed in the cover for removing and replacing the cover, said second hook operative to engage the strainer for removing and replacing the strainer, said net operative to be received in the strainer for removing debris therefrom.

3,856,680

AUTOMATIC SCREEN CHANGER FOR EXTRUDING PROCESSES

Jeffrey T. Elmore, Webster, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 15, 1973, Ser. No. 406,502
Int. Cl. B01d *35/18*
U.S. Cl. 210—184 **5 Claims**



1. In apparatus for extruding heat softened material wherein a filter screen enclosure having inlet and outlet parts is placed transverse the bore of an extruder housing the flow of heat softened material and periodic change of a filter screen in said filter screen enclosure of said extruder is required without interrupting the flow of heat softened material, the improvement which comprises:

a backing plate with spaced apart transverse support bars across the extruder bore in the filter screen enclosure of the extruder,

an elongated perforated rectangular breaker plate in matching engagement with a strip of filter screen in said inlet and outlet parts of said filter screen enclosure which will move with said screen across said backing plate and said extruder bore,

said breaker-plate-screen filter combination passing through said inlet and outlet parts in said filter enclosure provided with adjacent temperature adjusting means and said outlet port sized larger than said inlet port to permit the accumulation of a plug of solidified thermoplastic on the upstream side of the screen which is used under the influence of pressure to transversely move said breaker-plate-screen assembly when solidified thermoplastic material is softened in the inlet and outlet ports of said screen enclosure.

3,856,681

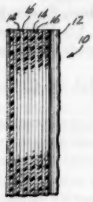
CHROMATOGRAPHY APPARATUS AND METHOD

Charles N. Huber, P.O. Box 172, Sequim, Wash. 98382

Filed Aug. 17, 1972, Ser. No. 281,511
Int. Cl. B01d *15/08*
U.S. Cl. 210—198 C **29 Claims**

1. In a chromatography column in which flow of a fluid to be separated occurs primarily along a predetermined axis, said column having a height dimension, a packing for said column comprising:

a plurality of layers of chromatographic media arranged contiguous to each other, said layers having a thickness dimension and a height dimension, said thickness dimension of said layers extending substantially perpendicularly to said predetermined axis, said height dimension of said



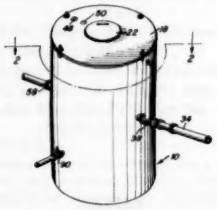
layers extending substantially parallel to said predetermined axis, said layers being substantially continuous and homogeneous to form a uniformly dense layer in both the thickness and height dimensions of said layers, said height dimension of said layers being substantially equal to the height dimension of said column.

3,856,682

TWO SHELL GRAVITY OIL-WATER SEPARATOR

Robert L. Summers, Roanoke, Va., assignor to William D. Mason, Jr., Roanoke, Va., a part interest

Filed Mar. 28, 1973, Ser. No. 345,696
Int. Cl. B01d *21/24*
U.S. Cl. 210—294 **7 Claims**



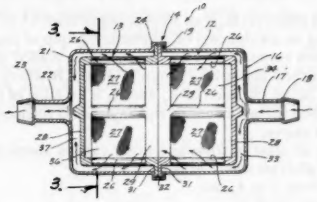
1. A gravity separator comprising a tank assembly defining first and second individual tank components, said first component including an upper inlet opening thereinto at a working level spaced below the upper end thereof and including means for the ingress of oil and water into said first component at said level in a generally horizontal direction, said second component including an upper outlet opening opening outwardly therefrom at a level spaced below the upper end thereof and generally horizontally aligned with the inlet, said second component including means defining an upstanding lift passage is closed communication with the outlet opening at its upper end and opening downwardly into a lower interior portion of said second component at its lower end, means defining a transfer passage having inlet and outlet ends communicated with a lower portion of the interior of the first component and an upper portion of the interior of the second component, respectively, a flow control valve operatively associated with said inlet and a flow control valve operatively associated with said transfer passage, and a gravity discharge outlet passage having its inlet end opening into the interior of said first component at a level spaced appreciably below the first mentioned level and at least somewhat above the lower end of said transfer passage, and flow control valve means operatively associated with said gravity discharge outlet passage.

3,856,683

DUAL FLOW FLUID FILTER

Erwin W. Parr, 3001 McKinley, Des Moines, Iowa 50321

Filed Dec. 15, 1972, Ser. No. 315,495
Int. Cl. B01d *29/14*
U.S. Cl. 210—336 **2 Claims**



1. A dual filter comprising:

a cylindral casing having a first portion with an inlet therein and a second portion with an outlet therein, said inlet and outlet being coaxially aligned;

first cylindrical filter means disposed in said first portion of the casing, said first filter means having a first perforate peripheral surface spaced from the interior of the casing, a first imperforate annular flange extended radially outwardly from one end of the first filter means and abutting a peripheral edge of said first portion of the casing;

second cylindrical filter means disposed in said second portion of the casing, said second filter means having a second perforate peripheral surface spaced from the interior of the casing, a second imperforate annular flange extending radially outwardly from one end of the second filter means and abutting the first annular flange of the first filter means and abutting a peripheral edge of said second portion of the casing;

clamping means on said casing for clamping the abutting first and second annular flanges between the peripheral edges of said first and second portions of the casing and thereby forming a seal thereat; and

supporting means for supporting said perforate surfaces of the first and second filter means, said supporting means comprising a plurality of parallel ribs extending from the first and second annular flanges, along the first and second perforate surfaces, to the other respective ends of said first and second filter means, said other ends of said first and second filter means being imperforate, and each other end having a tapering projection thereon which is coaxially aligned with the coaxially aligned inlet and outlet to thereby disperse the flow of fluid evenly through the filter.

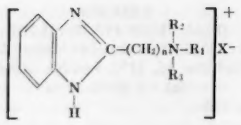
3,856,684

COMPOSITION CONTAINING BENZIMIDAZOLE DERIVATIVES FOR SOFTENING RINSE

Ronald Edward Atkinson, Tynemouth, England, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 230,032, Feb. 28, 1972, abandoned. This application May 18, 1973, Ser. No. 361,740
Claims priority, application Great Britain, Mar. 12, 1971, 6699/71
Int. Cl. D06m *13/46*
U.S. Cl. 252—8.8 **7 Claims**

1. A textile softening rinse composition consisting essentially of a quaternary ammonium benzimidazole derivative having the formula:



wherein either (i) R_1 is an alkyl group of from 14 to 22 carbon atoms or an alkylphenyl or alkylbenzyl group of from eight to 16 carbon atoms in the alkyl chain, and R_2 is alkyl of from one to six carbon atoms or a group $(C_2H_4O)_mH$ where *m* is from one to 20; or (ii) each of R_1 and R_2 is an alkyl of from 10 to 22 carbon atoms or an alkylphenyl or alkylbenzyl group as defined above;

R_3 is an alkyl of from one to six carbon atoms or a group (C_2H_4O)m where *m* is from 1 to 20;

n is from 1 to 4; and

X is an anion

and a pH buffering agent selected from the group consisting of water-soluble phosphates, carbonates, borates, citrates, tartrates and the corresponding acids thereof, the pH of a solution of the composition having 0.1 percent by weight of the benzimidazole derivative being below the pKa value of the benzimidazole derivative such that the benzimidazole derivative is in its cationic form.

3,856,685

LUBRICANT COMPOSITIONS

Kenjiro Mori, Takarazuka; Shigueaqui Ikebe, Toyonaka; Masaaki Hirooka, Ibaragi, and Takashi Kato, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 4, 1972, Ser. No. 311,526

Claims priority, application Japan, Dec. 2, 1971, 46-97641

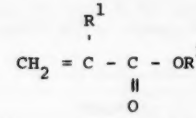
Int. Cl. C10m *1/28*

U.S. Cl. 252—56 R **4 Claims**

1. A lubricant composition comprising

100 parts by weight of an oil having a lubricant viscosity and

0.1 to 50 parts by weight of at least one copolymer of isobutylene, propylene or both thereof with at least one acrylic ester compound represented by the formula



wherein R^1 is a hydrogen or halogen atom, or a $C_{1\text{-}20}$ hydrocarbon or -halohydrocarbon radical, and R^2 is a $C_{1\text{-}20}$ hydrocarbon or -halohydrocarbon radical, in which the intrinsic viscosity of the copolymer is 0.02 to 3 dl/g as measured in benzene at 30°C, and wherein the copolymer consists essentially of alternating copolymers in which the member selected from the group consisting of isobutylene and propylene units is linked solely to the acrylic ester units and the acrylic ester units are linked only to the member selected from the group consisting of isobutylene and propylene units.

3,856,686

LUBRICANT CONTAINING THE INORGANIC POLYMERIC GRAPHITE FLUORIDE IN AN IMPROVED DISPERSED STATE THEREOF AND METHOD FOR THE MANUFACTURE OF THE SAME

Ken Sato, Yokohama, and Kikuo Nakamoto, Kyoto, both of Japan, assignors to Nippon Carbon Company Limited, Tokyo and Tamotsu Hori, Kyoto, both of, Japan

Filed Dec. 13, 1971, Ser. No. 207,652

Claims priority, application Japan, Dec. 21, 1970, 45-114910

Int. Cl. C10m *3/02*

U.S. Cl. 252—30 **2 Claims**

1. A method of manufacturing a dispersion of graphite fluoride in water, comprising the steps of:

1. dipping said graphite fluoride in an inert organic solvent selected from the group consisting of: alcohol and siloxane, thereby removing impurities on the surface thereof to activate said graphite fluoride;
2. then adding said graphite fluoride to water in an amount of 0.0001 – 60 percent by weight of graphite fluoride per unit of water;
3. then adding a colloidal silica powder having a purity of more than 98 percent, a particle size less than 60 millimicrons, with more than 90 percent of said particles being of size less than 20 millimicrons, and having a surface area of 100–400 m^2/g, in an amount 1/20 to 50 times by weight of said graphite fluoride to, the graphite fluoride and water; and
4. mixing and agitating said water, graphite fluoride and colloidal silica powder for a period of at least ten minutes under a reduced pressure of 1-720 mm Hg.

3,856,687

ACID NEUTRALIZING ACCELERATING COMPOSITIONS

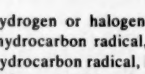
Warren Lowe, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 142,838, May 10, 1971, abandoned, which is a continuation-in-part of Ser. No. 45,567, June 11, 1970, Pat. No. 3,711,406. This application Nov. 5, 1973, Ser. No. 413,144

Int. Cl. C10m *1/40, 1/32*

U.S. Cl. 252—33.4 **3 Claims**

1. A lubricating oil composition comprising: a major amount of a hydrocarbon oil of lubricating viscosity; from about 0.01 to 5 weight percent of at least one oil-soluble acid neutralization accelerating compound of the formula



wherein R^1 is an ethylene or propylene radical, *a* is an integer in the range of 1 to about 12, and R^2 is an aliphatic hydrocarbon radical of molecular weight in the range from about 100 to about 2,000; and sufficient alkaline earth metal carbonate dispersed in said hydrocarbon oil with a sulfonate or phenate dispersant to provide an alkalinity value of 0.5 to 100 ml KOH/g.

3,856,688

ETHER-CONTAINING DIBASIC FATTY ACID METAL SOAP THICKENED GREASES

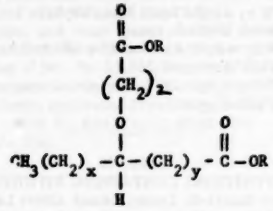
Harold E. Kenney, Jenkintown, and Edward T. Donahue, Philadelphia, both of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 275,009, July 25, 1972,. This application Aug. 24, 1973, Ser. No. 391,182

Int. Cl. C10m *5/16, 5/14, 7/24*

U.S. Cl. 252—39 **9 Claims**

1. A multipurpose grease comprising a major amount of a lubricating oil selected from the group consisting of paraffin oil and aliphatic diester oil and a minor thickening amount of a dibasic fatty soap of the formula



wherein the sum of *x* and *y* is a number from 10 to 19 and R is a metallic ion capable of forming a fatty soap.

3,856,689

OIL-SOLUBLE POLYMERS OF N-3-AMINOALKYL ACRYLAMIDES, AND LUBRICANTS CONTAINING THEM

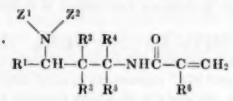
Donald Irvin Hoke, Chagrin Falls, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. Nos. 832,412, June 11, 1969, Pat. No. 3,666,810, and Ser. No. 203,853, Dec. 1, 1971,. This application Mar. 24, 1972, Ser. No. 237,871

Int. Cl. C10m *1/32*

U.S. Cl. 252—51.5 A **6 Claims**

1. A lubricating composition comprising a major amount of a lubricating oil and a minor amount, effective to impart dispersancy thereto or modify the viscosity thereof, of an oil-soluble interpolymer comprising (A) at least about 50 percent by weight of units derived by free radical polymerization from an alkyl acrylate or methacrylate in which the alkyl group contains at least about 8 carbon atoms, said interpolymer also containing (B) units derived by free radical polymerization from a monomer of the formula



wherein each of R^1, R^2 and R^3 is hydrogen or a hydrocarbon radical containing no more than about 30 carbon atoms; each of R^4 and R^5 is a hydrocarbon radical containing no more than about 30 carbon atoms; R^6 is a hydrogen or a lower alkyl radical; Z^1 is hydrogen or a hydrocarbon radical containing no more than about 30 carbon atoms and Z^2 is hydrogen, an alkyl or cycloalkyl radical, or

is piperidino or pyrrolidino.

3,856,690

LUBRICANT COMPOSITIONS CONTAINING DERIVATIVES OF ANTHRANILIC ACID

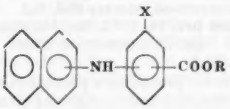
Milton Braid, Westmond, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 126,891, March 22, 1971, abandoned. This application Mar. 1, 1973, Ser. No. 337,185

Int. Cl. C10m *1/32*

U.S. Cl. 252—51.5 A **10 Claims**

1. A lubricant composition comprising a major amount of a lubricant and an amount sufficient to impart antioxidant properties thereto of an ester of anthranilic acid having the formula:



wherein R is an alkyl having from 1 to about 20 carbon atoms and X is a member of the group consisting of hydrogen, halogen, alkoxy, alkyl, nitro and cyano, wherein said alkoxy and alkyl contain from 1 to about 20 carbon atoms.

3,856,691

LUBRICATING OIL COMPOSITION

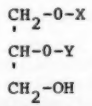
Haakon Haugen, Oslo, Norway, and David G. Weetman, Hopewell Junction, N.Y., assignors to Texaco, Inc., New York, N.Y.

Filed Dec. 15, 1972, Ser. No. 315,382

Int. Cl. C10m *1/22*

U.S. Cl. 252—52 R **8 Claims**

1. A lubricating composition comprising a lubricating oil as a major component and containing from about 0.05 to 1.0 weight percent of an additive represented by the formula:



in which X and Y alternatively represent hydrogen and a hydroxy-substituted radical having the formula:

in which R is an aliphatic hydrocarbon radical having from about 6 to 23 carbon atoms, one of X and Y being said hydroxy-substituted radical.

3,856,692

LIQUID ELECTROSTATOGRAPHIC DEVELOPER COMPOSITIONS

Joseph Mammino, and Alan B. Amidon, both of Penfield, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 873,105, Oct. 31, 1969, Pat. No. 3,692,520. This application Aug. 28, 1972, Ser. No. 284,319

Int. Cl. G03g *9/04*

U.S. Cl. 252—62.1 **1 Claim**

1. An electrostatographic developer composition comprising a liquid dispersion having a conductivity in the range of from about 10^{-4} to about 10^{-15} (ohm-centimeters)$^{-1}$ comprising

a carrier liquid having dispersed therein from about 15 to about 35 percent of finely divided toner material based

on the weight of the developer composition and from about 0.1 to about 1 percent of glyceryl tri-(12-hydroxy stearate) based on the weight of the developer composition.

3,856,693

METHOD FOR PRODUCING LEAD ZIRCONATE TITANATE POLYCRYSTALLINE CERAMICS

You Song Kim, Emmaus, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 18, 1972, Ser. No. 316,254

Int. Cl. C04b *35/46, 35/48*

U.S. Cl. 252—62.9 **7 Claims**

1. A process for producing a piezoelectric lead zirconate titanate polycrystalline body comprising sintering a structurally integrated body of comminuted material, said material having been produced by: forming a mixture of oxides or compounds which upon heating yield the oxides by combining constituents equivalent to 65 to 70 weight percent PbO, 19.5 to 21.1 weight percent ZrO_2, 9 to 13.8 weight percent TiO_2 and 0.4 to 1.5 weight percent Nb_2O_5; calcining the mixture; and comminuting the calcined material; characterized in that: calcining is carried out at a temperature of from 900° to 1100° C for from 2 to 20 hours; comminuting is carried out to achieve a granule size of up to 44 microns; sintering is carried out in a substantially pure oxygen atomsphere at a temperature of from 1240° to 1300° C for from 1 to 8 hours;

and further characterized in that amounts of SiO_2 and Al_2O_3 in the sintered product are limited to 0.07 weight percent and 0.15 weight percent, respectively.

3,856,694

PROCESS FOR STRIPPING NICKEL FROM ARTICLES AND COMPOSITION UTILIZED THEREIN

Donald H. Becking, Birmingham, Mich., assignor to Oxy Metal Finishing Corporation, Warren, Mich.

Filed June 18, 1973, Ser. No. 370,889

Int. Cl. C23g *1/04, 1/08*

U.S. Cl. 252—101 **8 Claims**

1. A composition for stripping accumulated nickel deposits from plating apparatus and the like, which comprises nitric acid and sources of chloride, copper and tellurium or selenium ions, said chloride ion being present in concentrations of about 0.01 to 0.5 M and said tellurium or selenium ions being present in small but effective amounts sufficient to accelerate the stripping rate without noticeable deleterious effects upon the plating apparatus.

5. An aqueous solution for stripping accumulated nickel deposits from plating apparatus, which contains therein about 2 to 10 grams per liter of tellurium or selenium dioxide, 600 to 850 grams per liter of nitric acid, 2 to 20 grams per liter of copper sulfate, and 3.5 to 35.5 grams per liter of a source of chloride ions.

7. In a method of stripping nickel deposits from articles by immersing them in a concentrated nitric acid solution containing a chloride catalyst, the improvement which comprises adding to said solution a small but effective amount of a selenite or tellurite compound capable of providing selenium or tellurium ions in the solution.

3,856,695

SOLVENT BASED DETERGENT

Richard Geiss, Lusshof, 8875 Offingens, 1 Donau, and Rolf Quarch, St. Johannsstrasse 37, 7912 Weissenhorn, both of Germany

Continuation-in-part of Ser. No. 60,924, Aug. 4, 1970, Pat. No. 3,737,386. This application Apr. 12, 1973, Ser. No. 350,393

Claims priority, application Germany, Aug. 6, 1969, 1940018The portion of the term of this patent subsequent to June 5, 1990, has been disclaimed.

Int. Cl. C09d *9/04*

U.S. Cl. 252—162 **14 Claims**

1. A solvent-based detergent composition that is miscible with water consisting essentially of

A. 10–80% by weight liquid aliphatic chlorinated hydrocarbons;

B. 10–40% by weight liquid lower aliphatic ketones and/or liquid lower aliphatic esters;

C. 5–50% by weight water-soluble alkanols having two to five carbon atoms and

D. 1–10% by weight of a detergent anionic or nonionic surface active agents.

3,856,696

COMPOSITIONS CONTAINING DITHIONITES

Derek James Stanbank, Leeds; Roland Albert Leigh, Harrogate, and Geoffrey Moorhouse Gibson, Leeds, all of England, assignors to The British Oxygen Company Limited, London, England

Filed Oct. 26, 1972, Ser. No. 301,028

Claims priority, application Great Britain, Oct. 26, 1971, 49707/71; Apr. 12, 1972, 16893/72

Int. Cl. C09k *3/00*

U.S. Cl. 252—188 **18 Claims**

1. A substantially anhydrous and homogeneous composition consisting essentially of a dithionite selected from sodium, potassium and calcium dithionites and from 0.1 to 10% by weight of said composition of an unsaturated carboxylic acid or an anhydride thereof.

3,856,697

LUMINESCENT ALKALI METAL GALLATE

Judicus Marinus Pieter Jan Verstegen, and Emiel Petrus Julianaan De Meester, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 29, 1973, Ser. No. 410,764

Claims priority, application Netherlands, Nov. 3, 1972, 7214859

Int. Cl. C09k *1/04, 1/68*

U.S. Cl. 252—301.4 R **5 Claims**

1. A luminescent alkali gallate activated by bivalent manganese which has a hexagonal crystal structure corresponding to the structure of β-alumina and which is defined by the formula:

$$(1-x)Me^{I}Ga_{11}O_{17} \cdot xMe^{II}Ga_{12}O_{19} : yMn^{2+},$$

in which Me^{I} represents at least one of the alkali metals Na, K, Rb and Cs and Me^{II} represents at least one of the alkaline earth metals Sr, Ba and Ca, in which formula from zero up to 75 mol % of Ga is replaced by Al and $O \leq x \leq 0.8$ and $0.0001 \leq y \leq 0.20$.

3,856,698

PREPARATION OF RARE-EARTH OXYSULFIDE LUMINESCENT MATERIAL

Dilip K. Nath, Mayfield, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed June 16, 1972, Ser. No. 263,418

Int. Cl. C09k *1/14*

U.S. Cl. 252—301.4 S **7 Claims**

1. A method for preparation of a crystalline rare-earth oxysulfide luminescent material having the general formula $Ln_{(2-x)}Ln'_xO_2S$ wherein Ln is one or more of Y, Gd, La and

Lu, and Ln′ is one or more of Dy, Er, Eu, Ho, Nd, Pr, Sm, Tb and Tm which comprises:

a. heating a rare-earth oxide mixture with H_2S gas at a temperature from about 700°C to 1000°C in a liquid fluxing medium containing an alkali metal sulfide selected from Na_2S, K_2S and Li_2S including mixtures thereof and a sufficient amount of an alkali metal sulfite compound to decompose and generate SO_2 during said heating until the oxysulfide material is formed, and

b. recrystallizing the oxysulfide material in the same liquid fluxing medium by heating to a temperature of at least about 1050°C in a inert atmosphere.

3,856,699

PROCESS FOR PRODUCING CAPSULES HAVING WALLS OF A WAXY MATERIAL

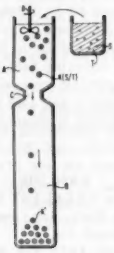
Shizuo Miyano, and Asaji Kondo, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 61,563, Aug. 6, 1970, abandoned. This application Oct. 24, 1972, Ser. No. 300,072

Claims priority, application Japan, Aug. 8, 1969, 44-62739

Int. Cl. B01j *13/02*; **B44d** *1/02*

U.S. Cl. 252—316 **12 Claims**



1. A process for producing controlled particle size capsules consisting essentially of walls of a single waxy material surrounding a single core material, said process comprising dropwise dispersing a waxy material containing a core material particle in a first agitated aqueous medium maintained at a temperature higher than the melting point of the waxy material, and allowing the waxy material containing said core material particle to fall by gravity from said first agitated aqueous medium into a second non-agitated aqueous medium maintained at a temperature lower than the melting point of the waxy material thereby forming said capsules, the size of the capsules being regulated by the amount of agitation in said first aqueous medium.

3,856,700

PERCURSOR COMPOSITIONS FROM ANIMAL HIDE GLUES FOR DRY-STRUCTURED FOAMS

Madeline G. Lambou, and James J. Spadaro, both of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Dec. 4, 1972, Ser. No. 311,611

Int. Cl. B01f *17/30*

U.S. Cl. 252—354 **7 Claims**

1. A foam precursor composition consisting of a homogenous aqueous emulsion of at least about 4% of an animal hide glue hydrolyzed to a jelly strength of 135–411 gms and about 2% of a surfactant.

3,856,701

ANTIFOAM COMPOSITION

Kermit W. Householder, Tonawanda, N.Y., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 144,263, May 17, 1971, Pat. No. 3,763,021. This application Apr. 9, 1973, Ser. No. 349,605

Int. Cl. B01d *19/04*

U.S. Cl. 252—358 **4 Claims**

1. An antifoam composition which consists essentially of

1. 1 to 20 percent by weight of a silicone-glycol copolymer having the general formula

$$(CH_3)_3SiO[(CH_3)_2SiO]_x[(CH_3)GSiO]_ySi(CH_3)_3$$

wherein

x has an average value from 50 to 100,

y has an average value from 5 to 10, and

G is a radical of the structure $-D(OR)_zA$ wherein

D is an alkylene radical containing from 1 to 30 carbon atoms,

R is composed of ethylene radicals and radicals selected from the group consisting of propylene and butylene radicals, the amount of ethylene radicals relative to the other alkylene radicals being such that the ratio of carbon atoms to oxygen atoms in the total OR blocks ranges from 2.3:1 to 2.8:1,

z has an average value from 25 to 100, and

A is a capping group selected from the group consisting of hydroxy, acyl, ether and carbonate ester capping groups,

2. 65 to 98 percent by weight of polypropylene glycol having an average molecular weight in the range of 1000 to 2000, and

3. 1 to 15 percent by weight of a hydrophobic silica.

3,856,702

ALUMINUM BORATE CATALYST COMPOSITIONS

Dennis P. McArthur, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 269,544, July 7, 1972, abandoned. This application Nov. 16, 1972, Ser. No. 306,984

Int. Cl. B01j *11/82*

U.S. Cl. 252—432 **20 Claims**

1. A catalyst composition consisting essentially of a minor proportion of a catalytically active component dispersed and supported on a shaped, porous cohesive aggregate consisting essentially of crystalline aluminum borate, said catalytically active component comprising at least one member selected from the group consisting of the metals of Groups IB, IIB, VB, VIB, VIIB and VIII, and catalytically active compounds thereof, said catalyst having been prepared by the steps of:

1. intimately admixing finely divided alumina in a dry or hydrous state with sufficient boria or boria precursor to provide in the finished catalyst a B_2O_3/Al_2O_3 weight ratio between about 8/92 and 25/75;

2. forming the resulting mixture into an aggregate of desired shape for catalytic contracting;

3. calcining the shaped aggregate for a time and at temperatures sufficient to form a cohesive crystalline aluminum borate aggregate having a surface area between about 1 and 150 m^2/g and a porosity of at least about 0.1 ml/g;

4. impregnating the calcined aggregate from step (3) with one or more soluble compounds of said catalytically active component; and

5. calcining the impregnated aggregate to convert said one or more soluble compounds to a catalytically active form.

3,856,703

INTERESTERIFICATION CATALYSTS CONSISTING OF AN ALKALI METAL DISPERSED IN A NEUTRALIZED AND SATURATED FAT

Johannes Jacobus Muller, Rotterdam, and Theodorus Joannes Kock, Heenvliet, both of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed May 31, 1973, Ser. No. 365,659
Claims priority, application Great Britain, June 2, 1972, 25841/72
Int. Cl. B01j *11/00*
U.S. Cl. 252—430 **7 Claims**

1. Interesterification catalyst essentially consisting of particles of an alkalimetal, at least 90 percent of which have a particle size of 0.3 to 1 mm, dispersed in a substantially completely saturated and substantially neutralized solid fat of a melting point of 25°–45°C and having no more than 0.05 percent by weight of water, the proportion of alkalimetal in fat being from 5–60 percent by weight.

3,856,704

PROCESS FOR PREPARING DESACETOXYCEPHALOSPORANIC ACIDS FROM CEPHALOSPORANIC ACIDS AND PALLADIUM OXIDE HYDRATE SUPPORTED ON ALPHA-CELLULOSE USEFUL IN THE PROCESS

Dale W. Blackburn, Moorestown, N.J.; Robert F. Devenney, Newtown Square, Pa., and John J. Mlynarski, Oaklyn, N.J., assignors to Smithkline Corporation, Philadelphia, Pa.

Division of Ser. No. 117,691, Feb. 22, 1971, Pat. No. 3,773,761. This application Aug. 7, 1973, Ser. No. 386,461
Int. Cl. B01j
U.S. Cl. 252—430 **1 Claim**

1. Palladium oxide hydrate supported on alphacellulose having a particle size of about 20 to 60 microns in average length and about 16 to 20 microns in average thickness.

3,856,705

ALUMINUM BORATE CATALYST COMPOSITIONS

Dennis P. McArthur, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 269,544, July 7, 1972, abandoned. This application Nov. 16, 1972, Ser. No. 307,105
Int. Cl. B01j *11/82*
U.S. Cl. 252—432 **15 Claims**

1. A shaped, porous, cohesive aggregate consisting essentially of crystalline aluminum borate having a surface area between about 1 and 150 m^2/g and a porosity of at least about 0.1 ml/gram, and wherein the weight-ratio of B_2O_3/Al_2O_3 is between about 8/92 and 25/75, said aggregate having been formed by calcining a preshaped composite of alumina and boria, or boria precursor, at temperatures between about 1,250° and 2,600°F for a sufficient time to produce said crystalline aluminum borate, said preshaped composite comprising between about 8% and 40% by dry weight of B_2O_3 equivalent.

3,856,706

HIGH SURFACE AREA SILICEOUS SUPPORT

Henry F. Harrison, Chattanooga, Tenn., and Moses P. Davis, Jr., White Bear Lake, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed June 8, 1972, Ser. No. 261,061
Int. Cl. B01j *11/32, 11/40, 11/58*
U.S. Cl. 252—450 **12 Claims**

1. Process for the production of a high specific surface area catalyst support which comprises subjecting a fired ceramic comprising cordierite and of desired geometrical shape and structure to the leaching action of an aqueous acid; for a time sufficient to remove at least a portion of the magnesium and aluminum combined in the cordierite of said fired ceramic followed by heating to a temperature no higher than about 1,000° C.; said acid being characterized by having a dissociation constant in water of at least 1×10^{-5} and forming soluble magnesium and aluminum salts.

3,856,707

METHOD FOR PREPARING A MONOLITHIC CATALYST CONTAINING A SOL AND THE CATALYST OBTAINED THEREFROM

Tadanari Kato; Tadashi Ikemi; Tutomu Ooishi, all of Yokohama, Japan; Mitsuyoshi Sano, Yokosuka; Hengo Hayashida, Yokosuka, and Chinami Matsumoto, Yokosuka, all of Japan, assignors to Nissan Motor Company Limited, Yokohama City, Japan

Filed Nov. 7, 1972, Ser. No. 304,300
Claims priority, application Japan, Nov. 8, 1971, 46-88299
Int. Cl. B01j *11/08*
U.S. Cl. 252—455 R **18 Claims**

1. A method of preparing a catalyst for use in exhaust gas after-treatment systems of hydrocarbon burning apparatuses comprising the steps of providing a monolithic carrier with a plurality of through passageways from one end to the other; preparing a mixed solution containing a catalytic compound of the platinum group and a sol of an alumina containing additive; immersing said monolithic carrier into said mixed solution; removing said monolithic carrier from said mixed solution; gelling said sol by using an alkali or an acid; drying said monolithic carrier in air to obtain a carrier coated with said catalytic compound and said alumina-containing additive; and subjecting the coated carrier to hydrogen gas at an elevated temperature for reducing said catalytic compound to metal, whereby said catalyst comprising said carrier, said alumina-containing additive and said metal dispersed in said alumina-containing additive is obtained.

3,856,708

ALUMINA CATALYST SUPPORT

Val G. Carithers, Little Rock, Ark., assignor to Reynolds Metals Company, Richmond, Va.

Filed Apr. 10, 1972, Ser. No. 242,748
Int. Cl. B01j *11/06*
U.S. Cl. 252—463 **10 Claims**

1. An alumina catalyst support consisting essentially of activated alumina having an LOI of about 1 to 5 percent, a surface area on the order of 200 m^2/gm, and a total pore volume of at least about 0.7 ml/gm, wherein a major portion of the pore volume associated with pores larger than 700 angstrom units is contributed by pores which are larger than 3,000 angstrom units, and in which said pores larger than 700 angstrom units contribute a pore volume of at least about 0.3 ml/gm.

3,856,709

COATING A SUBSTRATE WITH SOFT PARTICLES

Paolo Della Porta; Angelo Cantaluppi; Bruno Ferrario, and Paolo Montalenti, all of Milan, Italy, assignors to S.A.E.S. Getters S.p.A., Milan, Italy

Filed May 3, 1972, Ser. No. 249,772
Int. Cl. B01j *11/06, 11/08;* **B05b** *7/14*
U.S. Cl. 252—463 **16 Claims**

1. A method of producing a substrate having a particulate coating of high surface area to mass ratio, said method comprising in sequence the steps of:

I. disposing between a substrate and an intermediate body a mixture comprising:
   A. hard particles which are harder than the substrate and are harder than the intermediate body, and
   B. soft particles which are softer than the hard particles and are softer than the substrate;

II. compressing the substrate and intermediate body with particles therebetween whereby the intermediate body pushes the hard particles into the substrate; and

III. removing the intermediate body from the particles leaving the hard particles embedded in the substrate and the soft particles adhering to the substrate.

3,856,710
NICKEL/COPPER CHROMITE CATALYSTS FOR HYDROGENATING EDIBLE OILS

Karl J. Moulton, Brimfield, and Robert E. Beal, Elmwood, both of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 4, 1974, Ser. No. 438,960
Int. Cl. B01j *11/22*
U.S. Cl. 252—470 **3 Claims**

1. A catalyst composition for the selective partial hydrogenation of vegetable oils consisting essentially of a mixture of a nickel catalyst consisting essentially of nickel metal and hardened vegetable oil, and a copper chromite catalyst in proportions such that the weight ratio of nickel metal to copper chromite catalyst is from about 0.125:1000 to 0.50:1000. 1000.

3,856,711
LIQUID DETERGENT COMPOSITIONS

Marvin L. Mausner, Teaneck, and Arnold H. Dater, Fair Lawn, both of N.J., assignors to Witco Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 91,153, Nov. 19, 1970, Pat. No. 3,709,838, which is a continuation-in-part of Ser. No. 777,143, Nov. 19, 1968, abandoned, which is a continuation-n-part of Ser. No. 510,358, Nov. 29, 1965, abandoned. This application Nov. 29, 1972, Ser. No. 310,293The portion of the term of this patent subsequent to Jan. 9, 1990, has been disclaimed.
Int. Cl. C11d *3/075, 1/83, 3/26*
U.S. Cl. 252—545 **19 Claims**

1. In a method of making a polyfunctional essentially 100% active stable liquid detergent composition consisting essentially of the following ingredients in the following percentages by weight:

	%
A. An ethanolamine salt of a member selected from the group consisting of alkyl benzene- and alkyl toluene-sulfonic acids in which the alkyl radical contains from 8 to 18 carbon atoms.	30 to 90
B. A non-ionic normally liquid, water soluble surfactant comprising a polyoxyethylene-polyoxypropylene glycol condensation product	5 to 35
C. Fatty acid amides selected from the group consisting of monoethanolamide, diethanolamide and isopropanolamide in which the fatty acid acyl radical contains from 10 to 16 carbon atoms.	5 to 35

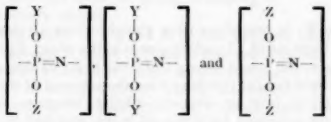
the steps which comprise forming a substantially homogeneous solution of the B ingredient with an ethanolamine, then gradually adding thereto, under conditions of agitation, a member selected from the group consisting of alkyl benzene and alkyl toluene-sulfonic acids in which the alkyl radical contains from 8 to 18 carbon atoms, said sulfonic acid being added in an amount essentially to be neutralized by said ethanolamine thereby to form the ethanolamine salt of said sulfonic acid, the temperature of the above mixture being maintained so as not to exceed about 100°C., and then adding under conditions of agitation, said C ingredient until a clear, homogeneous liquid is obtained.

3,856,712
POLY(ALKOXYARYLOXYPHOSPHAZENE) ELASTOMERS

Kennard A. Reynard, Mentor, and Selwyn H. Rose, Beachwood, both of Ohio, assignors to Horizons Incorporated, a Division of Horizons Research Incorporated, Cleveland, Ohio

Filed June 11, 1973, Ser. No. 368,844
Int. Cl. C08g *33/16, 33/02*
U.S. Cl. 260—2 P **10 Claims**

1. Polyphosphazene copolymers consisting of reacting units which are distributed in a nonregular fashion and are represented by the formulas:



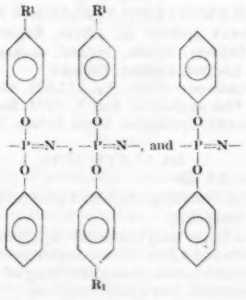
wherein each Y represents an alkyl group which contains from one to 15 carbon atoms and each Z represents an aryl group representing a formula selected from the group consisting of $-C_6H_4X$ and $-C_6H_3X_2$in which each X is selected from the group consisting of H, alkyl with 1 to 4 carbon atoms, Cl and Br and all of the X's need not be the same, and the ratio of Y:Z is between 4:1 and 2:3 and the number of such units in the copolymer is between 10 and 50,000.

3,856,713
ELASTOMERIC POLY(ARYLOXYPHOSPHAZENE) COPOLYMERS

Selwyn H. Rose, Beachwood, and Kennard A. Reynard, Mentor, both of Ohio. Assignor: Horizons Incorporated, a Division of Horizons Research Incorporated, Cleveland, Ohio

Filed June 11, 1973, Ser. No. 368,845
Int. Cl. C08g *33/16, 33/02*
U.S. Cl. 260—2 P **8 Claims**

1. Poly(aryloxyphosphazene) copolymers having a degree of polymerization between about 10 and about 50,000 consisting of repeating units distributed in a nonregular fashion and represented by the formulas:



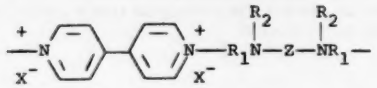
in which R_1 represents an alkyl radical selected from the group consisting of primary alkyls with 2 to 12 carbon atoms, secondary alkyls with 4 to 12 carbons and α,α-dimethyl tertiary alkyl radicals with from 4 to 14 carbon atoms, and the ratio of C_6H_5O to $R_1C_6H_4O$ is between 3:1 and 1:3.

3,856,714
POLYVIOLOGENS

Phyllis T. Moore, Morgantown, W. Va., and Myron S. Simon, West Newton, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Sept. 7, 1973, Ser. No. 395,255
Int. Cl. C08g *20/20, 33/02*
U.S. Cl. 260—2 R **30 Claims**

1. A polymer having in its structure repeating units of the formula:



wherein R_1 is propylene or a straight-chain alkylene group having from six to 12 carbon atoms in the chain; R_2 is —H or a hydrocarbon group having from one to six carbon atoms; Z is a bivalent radical resulting from the removal of both active halide atoms from an aromatic dihalide wherein said halide atoms are activated by virtue of being attached to the aromatic nucleus through a carbonyl group or by being directly attached to the carbon atom of a —C=N— group in the aromatic nucleus; or from an aliphatic dicarboxylic acid dihalide having a straight 4 to 8 carbon alkylene chain between terminal dicarboxylic acid halide groups; and X is an anion.

3,856,715
GUANIDINE GROUP CONTAINING ANION EXCHANGE RESINS FROM AMINO GROUP CONTAINING RESINS AND CYANAMIDES

Herbert Corte, Opladen; Harold Heller; Michael Lange, both of Koeln, and Otto Netz, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 29, 1972, Ser. No. 319,417
Claims priority, application Germany, Jan. 5, 1972, 2200457
Int. Cl. C05c *11/00;* **C05f** *11/00*
U.S. Cl. 260—2.1 R **18 Claims**

1. Process for the production of a strongly basic anion exchanger having guanidine groups which process comprises reacting a salt of a polymer containing at least one of the group consisting of primary and secondary amino groups, with a cyanamide reactant selected from the group consisting of cyanamide and alkylated cyanamide, in the presence of water, at a weakly acid pH value and at an elevated temperature.

3,856,716
HIGH DENSITY POLYURETHANE FOAMS

Victor Frederick Jenkins, St. Albans, England, and Daniel Anthony Doherty, Dublin, Ireland, assignors to Laporte Industries Limited, London, England

Continuation-in-part of Ser. No. 232,621, March 7, 1972, abandoned. This application Aug. 1, 1973, Ser. No. 384,568
Claims priority, application Great Britain, Mar. 10, 1971, 6513/71
Int. Cl. C08g *22/48*
U.S. Cl. 260—2.5 BD **4 Claims**

1. A method of making a flexible high density polyurethane foam which comprises:

a. taking a liquid polyfunctional copolymer, of MW between 700 and 4,000, of an ε-caprolactone and an epoxide selected from the group consisting of ethylene oxide, propylene oxide and epichlorohydrin;

b. reacting said copolymer with a diisocyanate compound thereby to obtain a stable, liquid isocyanate-terminated prepolymer

c. dissolving a diol of molecular weight below 140 copolymers of MW between 700 and 4,000 of an ε-caprolactone and an epoxide selected from the group consisting of ethylene oxide, propylene oxide and epichlorohydrin to form a liquid reactant mixture which is also stable and readily miscible, with said liquid prepolymer

d. dissolving a blowing agent in at least one of said prepolymer and said reactant mixture; and

e. mixing together said reactant mixture and said prepolymer to cause them to react and the blowing agent to generate a blowing gas thereby to form a flexible foam of density greater than 0.3 gm/cc.

3,856,717
RIGID POLYETHYLENE FOAM

Leslie Peter Theard; Frank Clyde Peterson, both of San Diego; John Lynn Russell, Jr., La Jolla, all of Calif., and Robert L. Reierson, Overland Park, Kans., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation of Ser. No. 204,353, Dec. 12, 1971, abandoned. This application June 25, 1973, Ser. No. 373,586
Int. Cl. C08f *47/10;* **C08j** *1/26*
U.S. Cl. 260—2.5 HA **4 Claims**

1. A process for preparing a rigid foam of polyethylene which consists essentially of the sequential steps of:

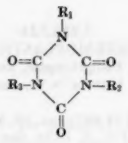
1. charging a pressure resistant vessel with particulate linear polyethylene having a density in the range of from 0.940 to 0.980 gram per cubic centimeter and having an average molecular weight greater than 100,000 (as determined by viscosity) and (b) a hydrocarbon containing 3–5 carbon atoms and having a boiling point below 30°C. at atmospheric pressure, the weight ratio of charged hydrocarbon to polyethylene being in the range of 1:1 to 5:1,
2. sealing the vessel from Step (1),
3. heating the sealed vessel from Step (2) to at least the critical temperature of the hydrocarbon contained in the sealed vessel and maintaining the sealed vessel at such temperature for 1 to 90 minutes,
4. cooling the contents of the sealed vessel to a temperature sufficiently below the melting point of the linear polyethylene charged in Step (1) so that the linear polyethylene solidifies in the sealed vessel,
5. opening the sealed vessel to vent the hydrocarbon therefrom, and
6. recovering a foamed polyethylene resin having a bulk density of less than 0.5 gram per cubic centimeter and a substantially uniform cell structure wherein at least 90% of the pore volumes or cells will each have a pore volume equal to the average pore volume multiplied by a factor in the range of 0.5 to 1.5.

3,856,718
MOLDED FLEXIBLE POLYURETHANE FOAMS

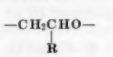
Bernard Taub, Williamsville, N.Y., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Sept. 18, 1972, Ser. No. 290,185
Int. Cl. C08g *22/14, 22/26, 22/44*
U.S. Cl. 260—2.5 AQ **17 Claims**

1. A polyurethane foam having a density in excess of 1.75 lb/ft³, a tensile strength of at least 12 psi, an elongation of at least 130%, a tear strength of at least 1.5 lb/in, a sag factor of above about 2.5, and compression set at 50%, after humid aging, of not greater than 30, prepared by the process comprising effecting reaction between an organic polyisocyanate selected from the group consisting of an undistilled toluene diamine phosgenation product, a polyaryl-polyalkylene polyisocyanate and a benzene triisocyanate, and a polyether polyol having a number average molecular weight between about 3,000 and 7,500 in the presence of a catalyst, a blowing agent comprising water and, as curing agent an isocyanurate polyol corresponding to the formula:



wherein R_1 is a hydrogen-terminated oxyalkylene chain of from 2 – 10 oxyalkylene units, and each of R_2 and R_3, which may be the same or different, is a hydrogen-terminated oxyalkylene chain of from 1 to 10 oxyalkylene units, wherein each oxyalkylene unit has the formula



wherein R at each occurrence independently is hydrogen, methyl or ethyl, in an amount of from about 1 to 8 percent, by weight, based on the weight of the polyether polyol.

3,856,719

PROCESS FOR PRODUCING FOAMED THERMOPLASTIC RESIN ARTICLES

Akira Miyamoto; Hiroyuki Akiyama; Toshiaki Noguchi, and Isao Ohtsuka, all of Kanagawa, Japan, assignors to Mitsubishi Gas Chemical Company, Inc. and Japan Styrene Paper, Inc., both of Tokyo, Japan

Filed Dec. 5, 1972, Ser. No. 312,277

Int. Cl. C08f *47/10, 29/12*

U.S. Cl. 260—2.5 HA **11 Claims**

1. A process for producing a formed article of thermoplastic resin by extruding into a low pressure zone, a molten thermoplastic resin composition, with or without a nucleating agent, said composition containing at least one organic foaming agent of a saturated hydrocarbon, a halide thereof or an ether, which is normally gaseous or liquid and having a boiling point of from −45°C to 70°C, which comprises using, as said thermoplastic resin composition, a composition consisting essentially of

I. 100 parts by weight of a low density polyethylene or a copolymer thereof with a vinyl monomer, said copolymer containing at least 80 mole % of ethylene as a monomer unit, and

II. from 10 to 60 parts by weight of (A) a polystyrene containing resin containing at least 50% by weight polystyrene and (B) a high density polyethylene, the amount of (B) being from 6 to 40 % by weight based on the total of (A) and (B).

3,856,720

CYCLIC NITRILE ADDUCT-EPOXIDE COMPOSITIONS

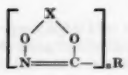
Jerry A. Dieter, Huntington Woods, Mich.; Donald H. Russell, and Richard W. Sauer, both of Cherry Hill, N.J., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 8, 1973, Ser. No. 339,239

Int. Cl. C08g *22/04, 33/02*

U.S. Cl. 260—2.5 A **14 Claims**

1. A method of preparing urethane or thiourethane compounds by catalytically condensing a vicinal epoxide compound with a cyclic nitrile adduct having the structure:



wherein **R** is an organic radical having from 2 to about 200,000 carbon atoms, and is free of reactive hydrogen atoms as determined by the Zerewitinoff test **X** is:

and *n* ranges from 2 to about 100,000 in the presence of a catalyst selected from the group consisting of

a. a tertiary amine,

b. a first metal or mixture of metals selected from Groups III through V of the Periodic Table and a second metal or mixture selected from the metals of Groups I and II and the Iron series of Group VIII of the Periodic Table,

c. a compound of aluminum, tin, titanium, zinc, bismuth or iron which is soluble in the reaction mixture provided that the metal is in a valence state other than zero, further provided that when the metal is aluminum, tin, titanium or bismuth there is an absence of metal from Groups I, II or the iron series of Group VIII of the Periodic Table, and when the metal is zinc or iron the reaction is conducted in the absence of metals in groups III to V of the Periodic Table, and

d. mixtures of (a) with (b) or (c).

3,856,721

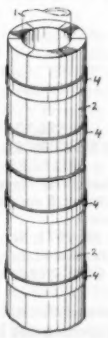
SYNTACTIC FOAMS AND THEIR PREPARATION

Larry Edwin Fritschel, Cuyahoga Falls, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Oct. 16, 1973, Ser. No. 406,793

Int. Cl. C08d *13/08, 5/02, 11/04*

U.S. Cl. 260—2.5 B **9 Claims**



1. The process of producing a syntactic foam which comprises curing in two stages a monomer-extended resinous polymeric composition in which are dispersed substantially 30 to 100 parts of microspheres per 100 parts of the polymer, the microspheres measuring substantially 20 microns to 1 inch in diameter, the size and amount of the microspheres being selected to produce a commercial foam, the polymeric material being at least largely a polymer selected from the class consisting of (a) homopolymers of butadiene and (b) copolymers of styrene and methyl and ethyl derivatives of styrene, in which at least 40% by weight is butadiene and at least 80% of the repeating butadiene units being of the 1,2-configuration, 100 parts of said polymeric material being compounded with 0.2 to 5 parts of a low-temperature-curing peroxide curing

agent, 0.1 to 5 parts of a high-temperature-curing peroxide curing agent, a mixture of 3–5 parts of cobalt naphthenate to 1 part of iron naphthenate with 5 to 20 parts of cobalt naphthenate per 100 parts of the low-temperature-curing peroxide, and 10 to 30 parts of acetylacetone as a curing accelerator per 100 parts of the low-temperature-curing peroxide; in the first stage, curing at a temperature of 50° to 150° F. until the polymer sets, without substantial heat-degradation of the polymeric material, and thereafter, in the second stage, completing the cure at a temperature of 175° to 375°F at which the higher-temperature-curing peroxide is effective.

3,856,722

NOVEL ALKALI METAL SALTS OF HIGHER ALIPHATIC FATTY ACID ETHANOLAMIDE SULFOSUCCINATE AS FOAMING AGENTS FOR LATICES AND COMPOSITIONS CONTAINING THE SAME

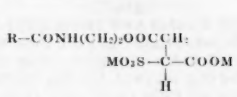
Emil Alfred Vitalis, Stamford, and Donald John Tracey, Jr., Fairfield, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. Nos. 361,115, May 17, 1973, abandoned, and Ser. No. 436,825, Jan. 25, 1974, abandoned. This application Feb. 12, 1974, Ser. No. 441,771

Int. Cl. C08d *13/10*; **C08f** *47/10*; **C08j** *1/16*

U.S. Cl. 260—2.5 L **6 Claims**

1. A foaming composition adapted for use as a coating for carpets which comprises a latex rubber and at least one foaming agent having the formula:



where R is a C_{12}–C_{22} fatty acid moiety and M is a cation selected from the group consisting of ammonium, sodium, potassium and lithium.

3,856,723

ELASTOMERS REINFORCED WITH SILICEOUS FILLERS

George Vrisakis, 4 Quai de la Plage 69, Collonges-Au-Mont D'Or, and Jean Machurat, 8 rue Descartes 69, Neuville-Sur-Saone, both of France

Filed Apr. 28, 1972, Ser. No. 248,547

Claims priority, application France, May 6, 1971, 71.17263

Int. Cl. C08c *9/14*, *11/10*, *11/14*

U.S. Cl. 260—4 **2 Claims**

1. An improved elastomeric composition which when vulcanized has improved properties, said composition consisting of a solid elastomer selected from the group consisting of natural rubber, copolymers of butadiene styrene, polybutadiene, butyl rubber, cis-polyisoprene, polychloroprene, ternary polymers of ethylene-propylene-diene monomers, and combinations thereof; a siliceous filler selected from the group consisting of clays, kaolins, precipitated silicates, thermal silicas, precipitated silicoaluminates, precipitated calcium silicates and combinations thereof; said siliceous filler being present in an amount such that the percentage by weight of said siliceous filler with respect to the elastomer is in the range of between 5 and 250%; and as an additive, polyvinyl alcohol, said polyvinyl alcohol comprising between about 0.5 and 20% by weight of the elastomer and from about 0.5 to 10% by weight of the siliceous filler, and said polyvinyl alcohol remaining in a free state to maintain all of its solubility in water.

3,856,724

REINFORCED THERMOPLASTIC COMPOSITIONS

James J. O'Connor, Poughkeepsie, and John T. Nolan, Jr., Wappingers Falls, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 111,087, Jan. 29, 1971, abandoned. This application Feb. 4, 1974, Ser. No. 439,208

Int. Cl. C08f *45/04*, *45/18*

U.S. Cl. 260—17.4 CL **10 Claims**

1. A reinforced thermoplastic composition comprising from about 5 to about 45 percent by weight of alpha-cellulose, from about 0.05 to about 35 percent by weight of an ionic hydrocarbon copolymer with the balance being a polyolefin selected from the group consisting of low density polyethylene, polypropylene and polybutene, the said ionic hydrocarbon copolymer comprising a copolymer of an alphaolefin having the formula:

$$R—CH=CH_2$$

wherein R is selected from the group consisting of hydrogen and alkyl radicals having from 1 to 8 carbon atoms and an alpha-beta-ethylenically unsaturated carboxylic acid having from 3 to 8 carbon atoms, said copolymer having from 10 to 90 percent of the carboxylic acid groups ionized by neutralization with metal ions uniformly distributed throughout the copolymer, said copolymer being a direct copolymer of the alpha-olefin and the unsaturated carboxylic acid in which the carboxylic acid groups are randomly distributed over all molecules and in which (1) the alpha-olefin content of the copolymer is at least 50 mole percent based on the alpha-olefin-acid copolymer, (2) the unsaturated carboxylic acid content of the copolymer is from 0.2 to 25 mole percent, based on the alpha-olefin-acid copolymer, and (3) any other monomer component optionally copolymerized in said copolymer is monoethylenically unsaturated, and said metal ions being selected from the group consisting of mon, di and trivalent ions of metals in Groups, I, II, III, IV-A and VIII of the Periodic Table of Elements and having an ionized valence of from 1 to 3 inclusive when the unsaturated acid is a monocarboxylic acid and an ionized valence of 1 when the unsaturated acid is dicarboxylic acid and said metal ions being selected from the group consisting of uncomplexed and complexed metal ions, said ionic copolymers having solid state properties characteristics of crosslinked polymers and metal-fabricability properties characteristic of uncrosslinked, thermoplastic polymers.

3,856,725

WATER-SOLUBLE RESINS AND METHODS FOR THEIR PREPARATION

Giorgio Montesissa, and Francesco Piepoli, both of Piacenza, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Filed Nov. 24, 1972, Ser. No. 309,060

Claims priority, application Italy, Nov. 29, 1971, 31773/71; Feb. 8, 1972, 20333/72

Int. Cl. C08g *45/06*

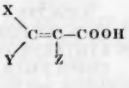
U.S. Cl. 260—18 EP **18 Claims**

1. An acidic resin comprising the reaction product of the following components:

I. an epoxy resin having a mean molecular weight between 100 and 20,000 and containing at least one oxirane ring per molecule;

II. at least one polyunsaturated monocarboxylic fatty acid having from 8 to 20 carbon atoms and more then one olefinic double bond; and

III. an α,β-unsaturated monocarboxylic acid of the formula:



wherein X, Y and Z are independently selected from the group consisting of hydrogen, alkyl of from 1 to 6 carbon atoms and phenyl groups wherein the molar ratio of said components (I), (II) and (III) is between 1:1:0.5 and 1:4:8.

3,856,726

THERMOPLASTIC COMPOUND OF POLYBUTENE-1

Gerhard Menzel; Eckhard Seidel, and Gunther Jaenichen, all of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed Sept. 14, 1972, Ser. No. 289,164

Claims priority, application Germany, Sept. 15, 1971, 2146068

Int. Cl. C08f *19/14, 21/14*

U.S. Cl. 260—23 H 11 Claims

1. A thermoplastic polybutene-1 composition consisting essentially of an admixture of solid polybutene-1 and an amount of up to 1% by weight of a water-insoluble magnesium compound having a solubility in water of less than about 1×10^{-3} at room temperature and an amount of up to 1% by weight of a phenolic antioxidant for polyolefins effective to improve the high-tension insulating properties of the polybutene-1, substantially free from other organic compounds.

3,856,727

LIGHT STABILIZED SYNTHETIC RESIN COMPOSITIONS CONTAINING CERTAIN BENZOTRIAZOYLPHENOXY TIN COMPOUNDS

Toshio Seki, Osaka; Kozaburo Suzuki, Kobe, and Takashi Matsuzaki, Osaka, all of Japan, assignors to Nitto Kasei Co., Ltd., Osaka, Japan

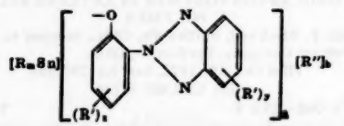
Division of Ser. No. 574,924, Aug. 25, 1966, Pat. No. 3,600,397. This application Dec. 8, 1969, Ser. No. 883,282

Claims priority, application Japan, Aug. 25, 1965, 40-51406

Int. Cl. C08f *45/62*

U.S. Cl. 260—23 X 2 Claims

1. A light-stabilized synthetic resin which contains an inhibiting amount of a compound of the formula



wherein

a. each R is independently selected from the group consisting of an alkyl of 1–18 carbon atoms, cyclohexyl, phenyl, and benzyl,

b. each R′ is independently selected from the group consisting of an alkyl of 1–12 carbon atoms, methoxy, hydrogen, and halogen,

c. each R″ is bonded to a tin atom and is selected from the group consisting of the residue of aliphatic monocarboxylic acids of 1–18 carbon atoms, alkyl mercaptides, alkyl esters of mercaptoacetic acid, benzyl maleates and hydroxyl groups,

d. each of *a* and *m* is an integer 1–3, *b* is 0 or an integer 1–2, *x* and *y* are 0 or integers 1–3, and $a + b + m = 4$, and

e. all unsubstituted valences of the atoms in said formula are bonded to hydrogen atoms.

3,856,728

ACRYLONITRILE-BUTADIENE-STYRENE POLYMERS HAVING IMPROVED RESISTANCE TO DISCOLORATION

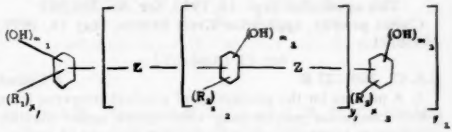
Charles Abramoff, New York, N.Y., assignor to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Apr. 26, 1971, Ser. No. 137,609

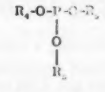
Int. Cl. C08f *45/58*

U.S. Cl. 260—23.7 N 10 Claims

1. An acrylonitrile-butadiene-styrene polymer having its resistance to deterioration when heated at 350°F and above enhanced by an amount within the range from about 0.1 to about 10 percent by weight of the polymer of a stabilizer combination comprising a polyhydric polycyclic phenol having the formula:



wherein R_1 and R_2 and R_3 are inert substituents selected from the group consisting of hydrogen, halogen, and organic radicals containing from one to about 30 carbon atoms selected from the groups consisting of alkyl, aryl, alkenyl, alkaryl, aralkyl, cycloalkenyl, cycloalkyl, alkoxy, aryloxy, acyl, carboxyl, and thiohydrocarbon groups, Z is selected from the group consisting of oxygen, sulfur, alkylene, alkenylene, alicyclene, arylene, and mixed alkylene-arylene and alkylene-alicyclene groups, m_1 and m_3 are integers from 1 to a maximum of 5, and m_2 is an integer from 1 to a maximum of 4, x_1 and x_3 are integers from 0 to 4, and x_2 is an integer from 0 to 3, y_1 is an integer from 0 to about 6, and y_2 is an integer from 1 to about 5; an organic phosphite having the formula:



wherein R_4, R_5 and R_6 are selected from the group consisting of alkyl, aryl, cycloalkyl, aryl alkyl, alkyl aryl, alkyl cycloalkyl and cycloalkyl alkyl groups having from one to about 30 carbon atoms, and an epoxy compound, the organic phosphite and epoxy compound each being in an amount within the range from about 2.5 to about 50 parts by weight, and the phenol being in an amount within the range from about 0.5 to about 50 parts by weight, the amount of each being selected within such ranges to enhance the stabilizing effectiveness of the others.

3,856,729

BUTADIENE RUBBER COMPOSITION

Joji Shimozato, Tokyo; Masashi Umeno, Kawasaki, and Shiro Yabuta, Tokyo, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Apr. 13, 1972, Ser. No. 243,828

Claims priority, application Japan, Apr. 15, 1971, 46-23442

Int. Cl. C08c *11/72*; C08d *9/14*

U.S. Cl. 260—23.7 M 10 Claims

1. In the rubber compositions for making vulcanized butadiene rubbers comprising polybutadiene, a vulcanizing agent consisting essentially of sulfur, and a vulcanizing activator, the improvement in which the amount of the vulcanizing agent, sulfur, is 0.1 to 0.6 gram per 100 grams of the rubber component, and the vulcanizing activator is at least one metal compound selected from the group consisting of zinc oxide, zinc compound selected from the group consisting of zinc carbonate, lithopone, fatty acid salts of zinc, dithioacid salts of zinc and thiazole salts of zinc, lead monoxide and cadmium oxide,

the amount of which corresponds to 1.23 to 6.2 milligram atoms of the metal per 100 grams of the rubber component.

3,856,730
POLYMER

David John Walker, Epsom, England, and Paul Branlard, Grenoble, France, assignors to BP Chemicals International Limited, London, England, by said Walker and Distugil S. A., Clichy, France, by said Branlard

Continuation of Ser. No. 250,980, May 8, 1972, abandoned. This application Sept. 10, 1973, Ser. No. 395,982
Claims priority, application Great Britain, May 14, 1971, 14930/71
Int. Cl. C08d 9/12
U.S. Cl. 260—27 R 8 Claims

1. A process for the production of a polychloroprene latex which comprises polymerising chloroprene under alkaline conditions in aqueous emulsion in the presence of a water soluble salt of an unbranched mercapto organic carboxylic acid.

3,856,731
WAXY COMPOSITION FOR PREVENTING RUBBERY SUBSTANCE FORM OZONE DETERIORATION AT MEDIUM AND/OR LOW TEMPERATURE

Toshihiko Shinomura, No. 438 Miyauchi, Kawasaki-shi, Kanagawa-ken, Japan

Filed Mar. 7, 1973, Ser. No. 338,799
Int. Cl. C08f 45/52; C08c 11/70
U.S. Cl. 260—28.5 B 3 Claims

1. A method of preventing a rubbery substance selected from the group consisting of natural rubber, styrene-butadiene rubber, butadiene rubber and Alfin rubber from ozone deterioration at temperatures between −10°C and 40°C, consisting essentially of the steps of mixing a waxy composition with said rubbery substance in raw state, said waxy composition containing at least 50 per cent by weight of normalchain saturated hydrocarbons having from 26 to 29 carbon atoms, the remainder of said wax being essentially free of aromatic components, aliphatic unsaturates and components removable by deoiling which selectively removes lower molecular weight fractions, subsequently vulcanizing said mixture, and leaving said vulcanized mixture as it is for letting said waxy composition bloom on the surface of said vulcanized mixture.

3,856,732
MODIFIED ASPHALT HYDRAULIC SEALER

Clarence R. Bresson, and Forrest D. Spaulding, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 22, 1973, Ser. No. 325,387
Int. Cl. C08f 45/52
U.S. Cl. 260—28.5 AS 5 Claims

1. A sealant composition consisting essentially of an air-blown cut-back asphalt having incorporated therein from 1 to 10 weight percent of asphalt of a hydrogenated random butadienestyrene copolymer having a butadiene content ranging from 30 to 44 weight percent with the remainder being styrene, and an approximate molecular weight in the range of 25,000 to 125,000, said copolymer having been hydrogenated to not more than 5 percent olefinic unsaturation.

3,856,733
POLYMERISATION PROCESS FOR GRAFTING VINYL CHLORIDE ON ETHYLENE-VINYL ACETATE COPOLYMER

Alan Charles Sturt, Guildford, and Richard Harvey Williams, Horsham, both of England, assignors to Vinyl Products Limited, Carshalton, Surrey, England

Continuation-in-part of Ser. No. 113,072, Feb. 5, 1971, abandoned. This application Aug. 10, 1972, Ser. No. 279,354
Claims priority, application Great Britain, Feb. 5, 1970, 5575/70
Int. Cl. C08f 45/24, 15/40
U.S. Cl. 260—29.6 RB 5 Claims

1. A copolymer latex capable of form coherent films which comprises a latex of an ethylene/vinyl acetate copolymer with a polymerised ethylene content of 5 to 45% by dry weight having vinyl chloride units graft polymerised therein wherein the copolymer contains 10–35% by weight of graft polymerised vinyl chloride units, said copolymer latex being capable of forming coherent films at 30° C or below.

3,856,734
AQUEOUS EMULSION OF INTERPOLYMER OF VINYL ACETATE N-METHYLOL ACRYLAMIDE AND ACRYLIC ACID

John G. Iacoviello, Somerville, N.J., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 139,828, May 3, 1971, Pat. No. 3,770,680. This application June 28, 1973, Ser. No. 374,402
Int. Cl. C08f 45/72
U.S. Cl. 260—29.6 TA 5 Claims

1. An aqueous emulsion of a thermosettable interpolymer of additively combined units of vinyl acetate, N-methylol acrylamide, and acrylic acid, said interpolymer containing about 5 to 20 weight percent of polymerized N-methylol acrylamide, about 1 to 3 weight percent of polymerized acrylic acid, and a balance consisting essentially of polymerized vinyl acetate, said emulsion containing an effective amount of an acidic curing catalyst selected from the group consisting of chromium nitrate, aluminum chloride, phosphoric acid, chromic acid, oxalic acid, nitric acid and citric acid, about 40 to 60 weight percent of water, and said emulsion being substantially devoid of solid particles having a size larger than 150 mesh (U.S. Sieve Series).

3,856,735
INCORPORATION OF HIGH MOLECULAR WEIGHT FLUOROCARBON POLYMER IN ARYLENE SULFIDE POLYMER

Jennings P. Blackwell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 19, 1972, Ser. No. 299,065
Int. Cl. C08f 45/24
U.S. Cl. 260—29.6 F 7 Claims

1. A process for forming poly(arylene sulfide) coating dispersions consisting essentially of the following steps: subjecting fluorocarbon polymer, in particulate form having a molecular weight sufficient to give a melt viscosity flow of 0 at 380°C using a 5,000 g. weight, to intensive milling by ball milling or rod milling with a liquid selected from water, ethylene glycol or propylene glycol; and thereafter adding thereto said poly(arylene sulfide) in particulate form and a pigment or filler in particulate form and subjecting the resulting mixture to additional intensive milling by ball milling or rod milling, the ratio of said fluorocarbon polymer to said pigment or filler being within the range of 0.1 to 3 parts by weight of fluorocarbon polymer per 1 part by weight of said pigment or filler, the ratio of said poly(arylene sulfide) to said fluorocarbon polymer being within the range of 2:1 to 40:1, and wherein the total solids content is within the range of 15 to 40 weight percent based on the total weight of said dispersion.

3,856,736

INCORPORATION OF HIGH MOLECULAR WEIGHT FLUOROCARBON POLYMER IN ARYLENE SULFIDE POLYMER

Dale O. Tieszen, and James T. Edmonds, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 19, 1972, Ser. No. 299,145
Int. Cl. C08f *45/24*
U.S. Cl. 260—29.6 F 10 Claims

1. A process for forming poly(arylene sulfide) coating dispersions consisting essentially of the following steps: subjecting fluorocarbon polymer, in particulate form having a molecular weight sufficient to give a melt viscosity flow of 0 to 380°C using a 5000 g. weight, to intensive dry milling by ball milling or rod milling with a pigment in particulate form; and thereafter subjecting the resulting mixture to intensive milling by ball milling or rod milling with said polyl(arylene sulfide) polymer in particulate form in a liquid selected from water, ethylene glycol, or propylene glycol, said fluorocarbon polymer being present in an amount within the range of 0.02 to 1 part by weight per 1 part by weight of said pigment, the ratio of said poly(arylene sulfide) to fluorocarbon polymer being within the range of 3:1 to **30:1** and, wherein the total solids content is within the range of 15 to 40 weight percent based on the total weight of said dispersion.

3,856,737

SURGICAL CEMENTS OF IMPROVED COMPRESSIVE STRENGTH CONTAINING STANNOUS FLOURIDE AND POLYACRYLIC ACID

John Foster, and Ernest Henry, both of London, England, assignors to The Amalgamated Dental Company, Limited, London, England

Filed Jan. 16, 1973, Ser. No. 324,225
Claims priority, application Great Britain, Jan. 14, 1972, 1899/72
Int. Cl. C08f *29/34*; A61k *5/00*, *5/02*
U.S. Cl. 260—29.6 M 6 Claims

1. A surgical cement consisting essentially of (a) zinc oxide together with from 5 to 10 percent by weight, based on the weight of said zinc oxide, of stannous fluoride, and (b) an aqueous solution of polyacrylic acid having a viscosity determined molecular weight of from 15,000 to 150,000; said cement comprising from 0.5 to 4 parts by weight of component (a) per part by weight of component (b).

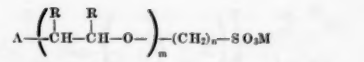
3,856,738

ACRYLONITRILE POLYMERS WITH REDUCED SURFACE RESISTANCE

Ferdinand Bodesheim; Eduard Radlmann; Heinz Schaffner, and Gunther Nischk, all of Dormagen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 1, 1972, Ser. No. 311,372
Claims priority, application Germany, Dec. 2, 1971, 2159834
Int. Cl. C08f *45/44*
U.S. Cl. 260—30.8 R 7 Claims

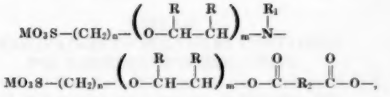
1. An antistatic acrylonitrile polymer composition which has incorporated therein an acrylonitrile polymer having at least 60 percent by weight of acrylonitrile and as an antistatic agent 1 to 20 percent by weight, based on the total weight of the polymer composition of a sulphonate groups containing polyalkylenoxide compound of the formula



wherein

R represents hydrogen or a methyl radical,

A represents the radicals



and

in which R_1 represents C_1—C_{30}—alkyl, R_2 C_2-C_{30}-alkylene radical, M an alkali metal or alkaline earth metal or an ammonium or alkylammonium radical, *m* represents an integer of from 1 to 150 and *n* represents an integer of from one to 6.

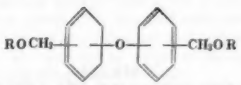
3,856,739

PLASTICIZED VINYL CHLORIDE POLYMERS CONTAINING ALKYLOXYMETHYL DIPHENYL OXIDES

David A. Nelson, Littleton, Colo., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 7, 1974, Ser. No. 449,144
Int. Cl. C08f *45/34*
U.S. Cl. 260—33.2 R 3 Claims

1. A plasticized vinyl chloride polymer containing a major proportion of polymerized vinyl chloride and as a plasticizing agent therefore from between about 40 and about 60 parts per hundred parts of polymer of a compound of the formula:



wherein R is selected from the group consisting of methyl, ethyl, propyl and butyl radicals.

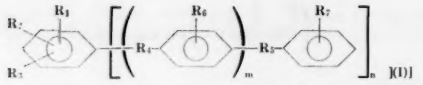
3,856,740

POLYSULFIDE RUBBER SEALANT COMPOSITION

Naoya Takahashi; Yoshiaki Aida, both of Yokohama, and Isoo Shimizu, Kawasaki, all of Japan, assignors to Nippon Petrochemicals Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1973, Ser. No. 336,376
Claims priority, application Japan, Mar. 7, 1972, 47-23464
Int. Cl. C08c *11/22*
U.S. Cl. 260—33.6 AQ 5 Claims

1. A polysulfide rubber compositon vulcanizable by a vulcanizing agent to produce a sealant which comprises a liquid polysulfide rubber and a plasticizing amount of a plasticizer comprising a compound or mixture of compounds represented by the following structural formula:



wherein R_6 and R_7 are H or CH_3, n is 1 or 2, m is 0 or 1 and $m + n$ is 2, R_1, R_2 and R_3 are H or alkyl having from 1 to 3 carbon atoms and the total number of carbon atoms in said R_1, R_2 and R_3 is in the range of from 1 to 4, and R_4 and R_5 are alkylene or polymethylene having from 1 to 3 carbon atoms.

3,856,741

ADHESIVE FOR CONCRETE AND METHOD OF PREPARATION

John A. Lovell, Monroe Falls, and Philip G. Harris, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 8, 1971, Ser. No. 105,128

Int. Cl. C08g *51/04*

U.S. Cl. 260—37 N **3 Claims**

1. A composition of matter characterized by being capable of meeting the requirements of ASTM method D-1191 and having a modulus at 0°F. of 87 to 425 and comprising the reaction product of a reactive hydrogen containing material of about 1,000 to 6,000 molecular weight selected from the class consisting of polyester polyols of glycols and dicarboxylic acids, polyether polyols and hydrocarbon polyols, an organic polyisocyanate having a functionality of about 2 to 3 and at least 24 parts and sufficient, but no more than 100 parts of white pigment for each 100 parts of reactive hydrogen containing material, said white pigment being selected from the class of calcium carbonate and a mixture of calcium carbonate, titanium dioxide and zinc oxide.

3,856,742

PROCESS FOR IMPROVING THE ANTI-FRICTION PROPERTIES OF POLYMERIC SUBSTANCES

Lutz Hoppe, and Rudolf Behn, both of Walsrode, Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Germany

Continuation of Ser. No. 258,468, May 31, 1972, abandoned, which is a continuation of Ser. No. 69,503, Sept. 3, 1970, abandoned. This application May 14, 1973, Ser. No. 359,644

Claims priority, application Germany, Sept. 3, 1969, 1944619

Int. Cl. C08g *51/04*

U.S. Cl. 260—37 N **2 Claims**

1. In the process of preparing a polyamide polymer containing silica in which said polyamide is the condensation product of a mixture of monomers consisting essentially of diamine and a dicarboxylic acid; the improvement comprising the steps of

a. adding a water dispersion of silica powder having an average particle diameter of 5 millimicrons to 100 microns to said diamine and forming a salt of the diamine and silica whereby hazing is reduced;

b. polycondensing said diamine and dicarboxylic acid to a polyamide containing silica condensed therein; in which the amount of silica powder is 0.01% to 10% by weight of said mixture of monomers.

3,856,743

ANTI-FOULING POLYESTER RESIN

Guy Balsacq, "Hucheloup" Kersoulard en Crach, 56400 Auray, France

Filed June 5, 1973, Ser. No. 367,182

Claims priority, application France, June 19, 1972, 72-21956

Int. Cl. C08g *51/24, 51/56, 51/62*

U.S. Cl. 260—40 R **6 Claims**

1. A composition for use in coating and forming articles to be protected from infestation by aquatic flora and fauna consisting essentially of at least one polymerizable polyester resin derived from phthalic acid, said phthalic acid being selected from the group consisting of isophthalic acid, orthophthalic acid, tetrahydrophthalic acid, terephthalic acid and mixtures thereof; at least one member of the group consisting of cupric, mercuric and stannic salts in a finely divided physical state in an amount of from 15% to 25% by weight, based on the resin content and a gelling amount of colloidal silica.

3,856,744

ULTRAVIOLET POLYMERIZABLE PRINTING INK COMPRISING VEHICLE PREPARED FROM BETA-HYDROXY ESTERS AND POLYITACONATES

Sol B. Radlove, Chicago; Abraham Ravve, Lincolnwood, and Kenneth H. Brown, Chicago, all of Ill., assignors to Continental Can Company, New York, N.Y.

Division of Ser. No. 242,793, April 10, 1972, Pat. No. 3,804,735. This application Jan. 28, 1974, Ser. No. 437,087

Int. Cl. C08g *51/04*; **C08k** *1/02*

U.S. Cl. 260—40 R **14 Claims**

1. An ultraviolet polymerizable printing ink comprised of a coloring compound in a vehicle comprised of

i. about 30 to 55 percent by weight of a beta-hydroxy ester prepared from a reaction mixture comprised of a polyepoxide containing at least two reactive epoxy groups and an alpha, beta-ethylenically unsaturated monocarboxylic acid having three to six carbon atoms,

ii. 2 to 10 percent by weight of a polyitaconate prepared from a reaction mixture comprised of a polyepoxide containing at least two reactive epoxy groups and itaconic acid,

iii. about 40 to about 70 percent by weight of a polyacrylate prepared from a polyhydric alcohol having 2 to 6 hydroxyl groups and an alpha, beta-ethylenically unsaturated monocarboxylic acid having 3 to 6 carbon atoms and

iv. about 0.1 to about 5.0 percent by weight of a photosensitizer.

3,856,745

PROCESS FOR THE PRODUCTION OF CARBONACEOUS GRAFT POLYMERS

Tadashi Yamaguchi; Takayuki Ono, both of Miyagi-ken; Hiroshi Hoshi, Chiba-ken; Michio Hirakawa, Chiba-ken, and Isao Watanabe, Chiba-ken, all of Japan, assignors to Lion Yushi Kabushiki Kaisha(Lion Fat & Oil Co., Ltd.), Sumida-ku Tokyo-to, Japan

Filed Sept. 17, 1973, Ser. No. 397,925

Claims priority, application Japan, Sept. 16, 1972, 47-93042

Int. Cl. C08f *45/08*

U.S. Cl. 260—42.14 **8 Claims**

1. A process for the production of a carbonaceous graft polymer having a high rate of grafting, comprising separately dispersing a finely divided carbonaceous material and at least one vinyl monomer in an aqueous medium and initiating graft polymerization of said monomer with said material while dispersed in said medium with an initiator consisting essentially of sulfur dioxide and recovering the resultant carbonaceous graft polymer.

3,856,746

THERMOPLASTIC COMPOSITION FOR MOLDING

Rinnosuke Susuki, Tokyo; Hiroshi Hoshi, Narashino; Jiro Saito, Tokyo; Keiichi Murakami, Sendai, and Hisashi Yamada, Ichikawa, all of Japan, assignors to Lion Fat & Oil Co. Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 185,436, Sept. 30, 1971, abandoned, which is a continuation of Ser. No. 842,391, July 16, 1969, abandoned. This application June 4, 1973, Ser. No. 366,417

Claims priority, application Japan, July 22, 1968, 43-51218; Sept. 9, 1968, 43-64276; Feb. 15, 1969, 44-11393

Int. Cl. C08f *45/04*; **C08g** *51/04*

U.S. Cl. 260—42.24 **5 Claims**

1. A thermoplastic moldable resin composition consisting essentially of a mixture of (1) 20 to 90 percent by weight, based on the total weight of the composition, of a finely divided filler material selected from the group consisting of calcium sulfite hemihydrate having a particle size of less than about 60μ and anhydrous calcium sulfite having a particle size of less than about 60μ, as the sole filler material in said composition and (2) the balance of the composition is resin ingredient consisting of (a) from 0 to 5 percent by weight, based on the total weight of the composition, of an ethylene-propylene rubber or a styrene-butadiene rubber and the balance of the resin ingredient (2) being (b) a resin selected from the group consisting of polyolefin, polyvinyl-chloride, polystyrene, vinyl chloride - vinyl acetate copolymer, ethylene - propylene copolymer, acrylonitrile-butadiene - styrene copolymer, polyamide, polyester and mixtures of polyethylene and and ethylene - vinyl - acetate copolymer.

3,856,747

PROGRAMMED DEGRADATION OF POLYOLEFINS

D. J. Dibiasi, South Plainfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 7, 1972, Ser. No. 278,671

Int. Cl. C08d *11/04*

U.S. Cl. 260—45.7 P **13 Claims**

1. A method of inhibiting the degradation of polyolefin resins, said resins having incorporated therein from about 50 parts/million to about 3,000 parts/million, based on the weight of the polyolefin, of a pro-degradant selected from the group consisting of manganese dioxide and cobalt naphthenate and having incorporated directly into the polyolefin resins from about 50 parts/million to about 500 parts/million based on the weight of the polyolefin, of a vaporizable stabilizer selected from the group consisting of tetrakis [methylene-(3,5-di-tert-butyl-4-hydroxyhydrocinnamate)] methane and 1,1,3-tris-(2'-methyl-4'-hydroxy-5'-tert-butyl phenyl) butane by maintaining said resins in a closed atmosphere and/or having therein as a separate entity a minor stabilizing amount of a vaporizable stabilizer selected from the group consisting of 2,6-di-tert-butyl-p-cresol, tris-nonylphenyl phosphite, zinc dibutyldithiocarbamate and dilaurylthiodipropionate.

3,856,748

COMPOSITIONS STABILIZED WITH HYDROXYPHENYL ACYLAMIDES

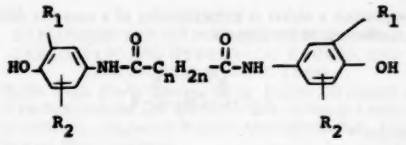
Martin Dexter, Briarcliff Manor, and Martin Knell, Ossining, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 125,828, March 18, 1971, Pat. No. 3,754,031, which is a continuation-in-part of Ser. No. 795,697, Jan. 31, 1969, abandoned. This application Mar. 19, 1973, Ser. No. 342,335

Int. Cl. C08g *51/60*, *51/58*; **C08d** *9/08*

U.S. Cl. 260—45.9 NC **5 Claims**

1. A composition of matter comprising polypropylene, natural rubber or butadiene-styrene elastomer normally subject to oxidative deterioration containing from 0.005 to 5% by weight of a hydroxyphenyl acylamide having the formula



wherein

R_1 and R_2 are independently alkyl groups containing up to 6 carbon atoms, and

n is a number from 2 to 10.

3,856,749

STABILIZATION OF POLYMERS CONTAINING POLY(ALKYLENE OXIDE) UNITS

Guenther Kurt Hoeschele, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

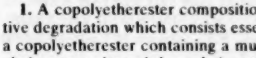
Filed Apr. 17, 1973, Ser. No. 351,818

Int. Cl. C08g *51/60*

U.S. Cl. 260—45.9 NC **10 Claims**

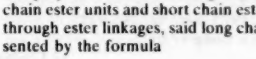
1. A copolyetherester composition stabilized against oxidative degradation which consists essentially of a mixture of (a) a copolyetherester containing a multiplicity of recurring long chain ester units and short chain ester units joined head-to-tail through ester linkages, said long chain ester units being represented by the formula

I

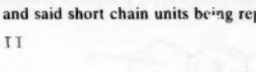


and said short chain units being represented by the formula

II



where G is a divalent radical remaining after the removal of terminal hydroxyl groups from a poly(alkylene oxide) glycol having a molecular weight of about 400–600 and a carbon to oxygen ratio of about 2.0–4.3; R is a divalent radical remaining after removal of carboxyl groups from a dicarboxylic acid or ester-forming equivalent thereof having a molecular weight less than about 300 and D is a divalent radical remaining after removal of hydroxyl groups from a diol having a molecular weight less than about 250; provided said short chain ester units amount to about 15–95 percent by weight of said copolyester, (b) 0.01 to 7 percent by weight of the composition of an additive having the general formula:



wherein R' and R'' are independently selected from the group consisting of C_1–C_{40} aliphatic or substituted aliphatic radicals and C_6–C_{20} aromatic or substituted aromatic radicals, and (c) 0.2 to about 5 percent by weight of an antioxidant.

3,856,750

POLYOLEFINS STABILIZED WITH NICKEL OR COBALT COMPLEXES OF HALOGENATED MONO OR DITHIO BETA DIKETONES

Jack P. Guillory, Bartlesville, Okla., and Ronald D. Mathis, Taylors, S.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.

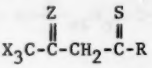
Filed Oct. 31, 1973, Ser. No. 411,455

Int. Cl. C08f *45/62*

U.S. Cl. 260—45.75 N **5 Claims**

1. A polyolefin composition having admixed therewith in an amount to impart thermal and ultraviolet light stability to the

composition a nickel or cobalt comlex of a mono or dithio-beta diketone of the formula:



wherein

Z = oxygen or sulfur,

X = fluorine, chlorine, bromine or iodine, and

R is a hydrocarbyl radical selected from alkyl, aryl and cycloalkyl radicals and combinations thereof containing from 1 to 18 carbon atoms.

3,856,751

DIACID-XANTHYLIUM ION POLYESTER AND PHOTOGRAPHIC ELEMENT COMPRISED THEREOF

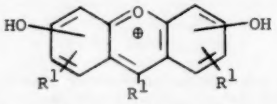
John C. Wilson, Irondequoit, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 14, 1972, Ser. No. 262,911

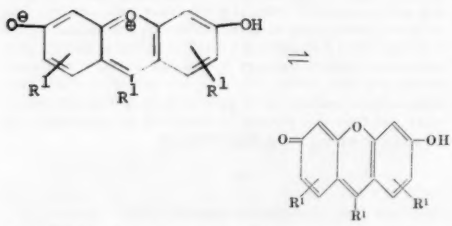
Int. Cl. C08g *17/08*

U.S. Cl. 260—47 C **12 Claims**

1. A linear polyester having an inherent viscosity in the range of from 0.2 to 1.5 and having as a repeating unit thereof the ester of (1) an organic diacid or ester forming derivative thereof and (2) a xanthylium ion having a formula selected from the group consisting of:



and



in which R^1 is in each occurrence independently chosen from the group consisting of hydrogen, alkyl, aromatic, halogen, alkoxy and cyano substituents; where the inherent viscosity is measured at 25°C using a solution containing 0.10 grams of said polyester per 100 ml. of solution in which the solvent is a mixture of phenol and chlorobenzene in equal parts by weight.

3,856,752

SOLUBLE POLYIMIDES DERIVED FROM PHENYLINDANE DIAMINES AND DIANHYDRIDES

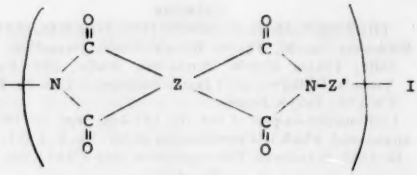
John Bateman, Bardonia, and David A. Gordon, Scarsdale, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 1, 1973, Ser. No. 402,646

Int. Cl. C08g *20/32*

U.S. Cl. 260—65 **14 Claims**

1. A soluble polyimide consisting essentially of the recurring unit having the formula



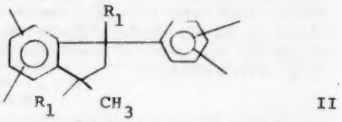
wherein the four carbonyl groups are attached directly to separate carbon atoms, the carbonyl groups being ortho or peri to each other so that five or six membered imide rings are formed respectively;

wherein Z is a tetravalent radical containing at least one aromatic ring; and

wherein Z' is a divalent organic radical selected from aromatic, aliphatic, alkyl aromatic, cycloaliphatic, and heterocyclic radicals, combinations of these, and radicals with heteroatom-containing bridging groups where the heteroatom in the bridge is oxygen, sulfur, nitrogen, silicon or phosphorus, provided that

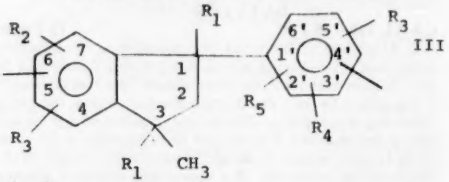
1. out of the total number of polyimide recurring units

A. 0 to 100 percent of such units have Z equal to a phenylindane radical of the structural formula



wherein R_1 is hydrogen or an alkyl group of from 1 to 5 carbon atoms, and

B. 0 to 100 percent of such units have Z' equal to a phenylindane radical of the structural formula



wherein

R_1 is hydrogen or alkyl group of from 1 to 5 carbon atoms, and

R_2, R_3, R_4 and R_5 are independently hydrogen, halogen or (lower)alkyl having 1 to 4 carbon atoms,

2. out of the total number of Z and Z' radical units, at least 10 percent are phenylindane radical units, and

3. the polyamide acid, from which the soluble polyimide is produced, has an inherent viscosity of at least 0.1, measured at 25°C at a concentration of 0.5 percent by weight of the polymer in N,N-dimethylacetamide, N-methylpyrrolidone, or dimethylformamide.

3,856,753

COPOLYESTER POLYMER OF ENHANCED DYEABILITY

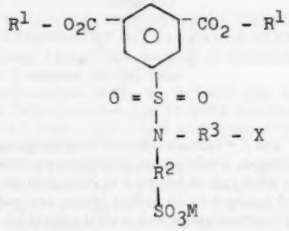
Charles Leroy Henry, Asheville, and Gerald Willard McNeely, Arden, both of N.C., assignors to Akzona Incorporated, Asheville, N.C.

Filed July 17, 1972, Ser. No. 272,243

Int. Cl. C08g *17/08*

U.S. Cl. 260—75 N **10 Claims**

1. Copolyester polymer consisting essentially of segments selected from the group consisting of alkylene terephthalate and alkylene isopthalate and containing units derived from about 0.5 to about 10 mole percent sulfonamide comonomer dye sensitizing reactant having the formula:



wherein R^1 is selected from the group consisting of H and a lower alkyl radical containing from 1 to about 4 carbons; R^2 is an alkyl radical of from 1 to about 10 carbons; R^3—X is H or a radical selected from the group consisting of an alkyl radical of from 1 to 10 carbons, cyclohexyl and an alkylene radical of from 1 to 10 carbons, said alkylene radical being $-SO_3M$ terminated; and M is selected from the group consisting of alkaline earth and alkali metals.

3,856,754

LINEAR HOMOPOLYESTERS AND COPGLYESTERS BASED ON METHYLENE-BIS(HYDROXYALKYLDIMETHYL HYDANTOINS)

Jurgen Habermeier, Pfeffingen, Switzerland; Lothar Buxbaum, Lindenfels, Germany, and Hans Batzer, Arlesheim, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

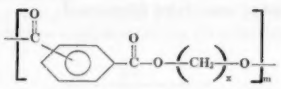
Filed Aug. 9, 1973, Ser. No. 387,060

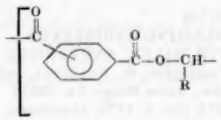
Claims priority, application Switzerland, Aug. 25, 1972, 12654/72

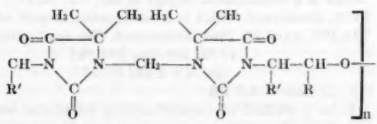
Int. Cl. C08g *17/08*

U.S. Cl. 260—75 N **3 Claims**

1. A linear, thermoplastic homopolyester or copolyester having a relative viscosity of 0.5 – 3.0 dl/g, measured at 30°C on a 1% strength solution consisting of equal parts of phenol and tetrachloroethane, said polyester consisting essentially of the structural element of the formula







wherein the two carbonyl groups located on the aromatic ring are in the para-position or meta-position to one another, R denotes a hydrogen atom, the methyl or ethyl group, R′ denotes a hydrogen atom or together with R denotes the tetramethylene radical, *x* represents a number from 2 to 10, *m* represents 0 or integers and *n* represents integers, with the ratio of *n* to *m* corresponding to the quotient of $n/m + n =$ 0.005 to 1.0.

3,856,755

OLIGOMERS AND/OR POLYMERS CONTAINING CARBOXYLIC AND HYDROXYLIC GROUPS, AND PROCESS FOR MAKING THEM

Wilhelm Vogt, Hurth-Efferen; Edgar Fischer, Frankfurt am Main-Schwanheim, and Eberhard Auer, Erftstadt-Liblar, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

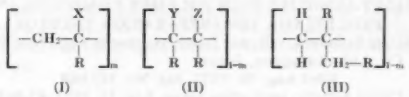
Filed Dec. 20, 1972, Ser. No. 316,659

Claims priority, application Germany, Dec. 28, 1971, 2164888

Int. Cl. C08f *27/02, 27/14*

U.S. Cl. 260—78.5 T **4 Claims**

1. Polymer complex formers and sequestering agents for polyvalent metal ions which are the hydrolysates of halogenated copolymers, the said hydrolysates containing substantially between 51 and 77 weight % of free or lactonized carboxylic groups, substantially between 1 and 29.5 weight % of free or lactonized hydroxylic groups, and having a specific viscosity substantially between 0.1 and 2.0, determined on a 1 weight % solution in dimethyl formamide at 25°C; the halogenated copolymers having substantially between 5 and 60 weight % of halogen therein, a relative viscosity substantially between 0.1 and 5, determined on a 4 weight % aqueous solution at 25°C and a principal chain based on structural units, in any desirable sequential arrangement, of the following general formulae I and II or I and III



(I) (II) (III)

in which X, Y and Z stand for a hydrogen and/or halogen atom with the proviso that at least one of the X, Y and Z substituents stand for a halogen atom, R stands for a carboxyhalide radical, a carboxylic group, ester group, nitrile group or anhydride group, and the mole fraction m stands for a number greater than zero and smaller than 1.

3,856,756

SILYL SUBSTITUTED UREA DERIVATIVES AND A PROCESS FOR THEIR PREPARATION

Kuno Wagner, Leverkusen; Gunter Oertel, Cologne, both of Germany; Hans Dietrich Golitz, deceased, late of Cologne, Germany (by Ingrid Irene Klarch Golitz, heiress), and Bernd Quiring, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

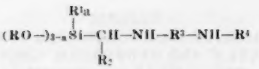
Filed Nov. 3, 1972, Ser. No. 303,671

Claims priority, application Germany, Nov. 6, 1971, 2155259

Int. Cl. C08g *22/08*

U.S. Cl. 260—77.5 AQ **5 Claims**

1. A process for the preparation of polyaddition products which contain alkoxysilane groups, comprising reacting in the presence of 10 to 80% by weight based on the sum of the reactants of a secondary or tertiary alcohol at a temperature between −20°C and +150°C an alkoxysilane group of the general formula



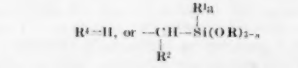
in which

R represents a C_1–C_{18} alkyl radical or a C_4–C_{14} cycloalkyl radical, a phenyl or a benzyl radical,

R^1 represents a C_1–C_{18} alkyl, C_4–C_{18} cycloalkyl or C_6–C_{10} aryl radical,

R^2 represents a hydrogen atom or a methyl or phenyl radical,

R^3 represents a C_2–C_{16} divalent aliphatic hydrocarbon radical and the radical obtained by removing the amino groups from 1-amino-3,3,5-trimethyl-5-aminomethylcyclohexane



and $a = 0$, 1 or 2, with organic polyisocyanates.

3,856,757

LIGHT-SENSITIVE HIGH POLYMER COMPOUND AND PROCESS FOR THE PREPARATION THEREOF

Masato Satomura, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 30, 1973, Ser. No. 393,088

Claims priority, application Japan, Aug. 31, 1972, 47-86688

Int. Cl. C08g *22/12*

U.S. Cl. 260—77.5 CR **10 Claims**

1. A process for preparing a light-sensitive high molecular weight polymer compound, which comprises reacting an α,β-unsaturated carboxylic acid with an aliphatic or aromatic diepoxide to form the corresponding diol compound and reacting a diisocyanate compound with said diol compound.

3,856,758

POLYMERS OF CYANO-SUBSTITUTED NORBORNENE DERIVATIVES AND METHOD FOR PREPARING THE SAME

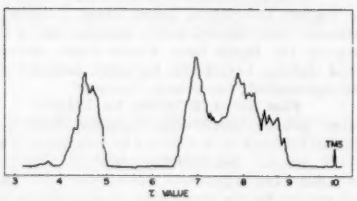
Takashi Ueshima, Yokohama; Shoichi Kobayashi, and Masami Matsuoka, both of Tokyo, all of Japan, assignors to Showa Denko K.K., Tokyo, Japan

Filed Mar. 27, 1973, Ser. No. 345,437

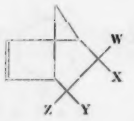
Claims priority, application Japan, Mar. 31, 1972, 47-31755; Nov. 1, 1972, 47-108902

Int. Cl. C08f *1/28, 5/00*

U.S. Cl. 260—78.4 N **31 Claims**



1. Polymers prepared with a reduced viscosity of 0.1 to 20 by ring-opening polymerization of cyano-substituted norbornene derivatives expressed by the following general formula



where:

W, X, Y and Z = radicals selected from the group consisting of hydrogen, nitrile group, substituents containing nitrile group, alkyl radical having 1 to 20 carbon atoms, alkenyl radical having 6 to 20 carbon atoms, aryl radical having 1 to 20 carbon atoms and aralkyl radical having 1 to 20 carbon atoms, at least one of said W, X, Y and Z radicals being selected from the group consisting of nitrile group and the substituents containing nitrile group.

3,856,759

VEHICLES FOR PRINTING INK

Hitoshi Koishi; Michio Takao; Yasuhiro Oda, all of Tokyo; Hideo Iguchi, Saitama-ken, and Shigeru Kohase, Chiba-ken, all of Japan, assignors to Tokyo Printing Ink Mfg. Co., Ltd., Tokyo, Japan

Filed Oct. 13, 1972, Ser. No. 297,263

Claims priority, application Japan, Oct. 19, 1971, 46-82115

Int. Cl. C08f *27/08*

U.S. Cl. 260—78.4 D **4 Claims**

1. A vehicle for a printing ink which comprises a resinous ingredient prepared by allowing a petroleum resin having a softening point between 80° to 180°C to undergo an addition reaction with an unsaturated dibasic acid or anhydride thereof and then allowing the addition product to react with a polyalkylene polyamine in which two or three amino groups are bonded to different carbons of more than two alkyl groups of methylene, ethylene, propylene, or butylene, two of the amine groups being located at both terminals of the molecule, the amount of said polyalkylene polyamine being from 0.1 to 3 mols per mol of unsaturated dibasic acid.

3,856,760

METHOD OF COPOLYMERIZING UNHINDERED CONJUGATED DIENES WITH MALEIC ANHYDRIDES

C. Michael Fontana, Rt. 2, Washington, W. Va. 26181, and Byran Sparks, 860 Sinclair Dr., Baton Rouge, La. 70815

Continuation of Ser. No. 79,275, Oct. 8, 1970, abandoned, which is a continuation-in-part of Ser. No. 36,497, May 11, 1970, abandoned, which is a continuation-in-part of Ser. No. 724,590, April 26, 1968, abandoned. This application Oct. 24, 1972, Ser. No. 299,985

Int. Cl. C08f *15/02*

U.S. Cl. 260—78.5 BB **1 Claim**

1. In a method of copolymerizing butadiene with maleic anhydride, the improvement comprising the step of reacting the maleic anhydride and butadiene in the presence of an organic solvent selected from the group consisting of acetone and tetrahydrofuran and also in the presence of a catalyst-accelerator combination of substantially equal molar amounts of solid ammonium persulfate and solid sodium bisulfite in an amount of combined weight from 4–7 per cent based on the combined weight of monomers, the amount of solvent being present in a weight ratio to combine monomers in a range of 2:1 to 5:1.

3,856,761

SULFUR VULCANIZATION SYSTEM CONTAINING A TWO-COMPONENT ACCELERATOR SYSTEM

Frank S. Maxey, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 215,411, Jan. 4, 1972, abandoned. This application Apr. 18, 1972, Ser. No. 245,262

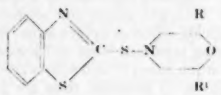
Int. Cl. C08c *11/62;* **C08d** *9/00;* **C08f** *27/06*

U.S. Cl. 260—79.5 B **3 Claims**

1. A sulfur vulcanizable diene rubber containing 0.10 to 3.25 parts of free sulfur per 100 parts by weight of rubber and 0.10 to 3.25 parts by weight per 100 parts by weight of rubber of an accelerator system for the sulfur vulcanization of rubber comprising

A. 2-(morpholinodithio)-benzothiazole, and

B. at least one amino thiazole monosulfide compound having the following structural formula:



wherein R and R¹ are the same and are selected from the group consisting of hydrogen and alkyl radicals having one to four carbon atoms wherein the weight ratio of (A) to (B) is 1/1 to 7/3 and the combined amount of sulfur plus the accelerator system is from 2.25 to 5.50 parts by weight per 100 parts.

3,856,762

SULFONAMIDE ADDITIVES FOR SULFUR VULCANIZABLE POLYMERS

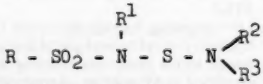
Roger J. Hopper, Akron, and John P. Lawrence, Stow, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed June 26, 1972, Ser. No. 266,009

Int. Cl. C08f *27/06;* **C08c** *11/60;* **C08d** *9/00*

U.S. Cl. 260—79.5 B **8 Claims**

1. A sulfur vulcanizable diene polymer having incorporated therein at least one compound having the following structural formula



wherein R and R¹ are selected from the group consisting of alkyl radicals having one to 20 carbon atoms, cycloalkyl radicals having five to 20 carbon atoms, aralkyl radicals having seven to 20 carbon atoms, aryl radicals having six to 20 carbon atoms and wherein R can also be the radical

and wherein R and R¹ can be joined through a $-CH_2-$ group to constitute with the $-SO_2-N-$ group a heterocyclic ring radical, wherein R^5 and R^6 are selected from the group consisting of alkyl radicals having one to 20 carbon atoms, cycloalkyl radicals having five to 20 carbon atoms, aralkyl radicals having seven to 25 carbon atoms, and aryl radicals having six to 20 carbon atoms and wherein R^5 and R^6 can be joined through a member of the group consisting of $-CH_2-$, $-O-$, and $-S-$ to constitute with the attached nitrogen atom a heterocyclic ring, and wherein R^2 and R^3 are selected from the group consisting of hydrogen, cyanoalkyl radicals having three to 21 carbon atoms and radicals, other than aryl, described for R^5 and R^6 and can join to form the heterocyclic ring described for R^5 and R^6.

3,856,763

PROCESS FOR THE PREPARATION OF HIGH MOLECULAR WEIGHT, HIGH UNSATURATION ISOBUTYLENE-CONJUGATED DIENE COPOLYMERS

Warren A. Thaler, Matawan; Donald J. Buckley, Sr., Plainfield, both of N.J., and Joseph P. Kennedy, Akron, Ohio, assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 151,038, June 8, 1971, Pat. No. 3,808,177. This application Apr. 6, 1973, Ser. No. 348,678

Int. Cl. C08d *1/04;* **C08f** *1/72*

U.S. Cl. 260—80.7 **13 Claims**

1. A process for preparing substantially gel-free copolymers consisting essentially of an isoolefin having about four to about 10 carbon atoms and conjugated dienes having about five to about 14 carbon atoms wherein said dienes are selected from the group consisting of (1) at least one acyclic diene wherein said acyclic diene is isoprene, piperylene, 2,3-dimethylbutadiene, or mixtures thereof, (2) cyclopentadiene and (3) cyclopentadiene and at least one second diene wherein the second diene is isoprene, piperylene, 2,3-dimethyl butadiene, or mixtures thereof comprising at least 8 to about 40 mole percent unsaturation; said polymer having a number average molecular weight of at least 120,000, which comprises carrying out a solution polymerization at a temperature below −100°C. in a feed consisting of about 5 to about 40 volume percent of a cosolvent and about 95 to about 60 volume percent monomers using as the catalyst a catalytic amount of a hydrocarbyl-aluminum dihalide, said dihalide being a dibromide or a dichloride; wherein said polymerization is carried out to a conversion level of about 2 to about 20 percent.

3,856,764

POLYMERIZATION PROCESS

Morford C. Throckmorton, and William W. Saltman, both of Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 202,024, Nov. 24, 1971, abandoned. This application July 18, 1973, Ser. No. 380,176

Int. Cl. C08d *1/14*

U.S. Cl. 260—82.1 **8 Claims**

1. In a process for the polymerization of butadiene and butadiene in mixture with other diolefins to form polymers containing a high proportion of the butadiene units in the cis-1,4 configuration comprising contacting at least one monomer from the group of butadiene and butadiene in mixture with other diolefins under polymerization conditions with a catalyst consisting essentially of (1) organoaluminum compounds, (2) nickel compounds selected from the class consisting of nickel salts of carboxylic acids, organic complex compounds of nickel, nickel tetracarbonyl, and mixtures thereof, wherein the improvement comprises using (3) hydrogen fluoride complexes (HFC) prepared by complexing hydrogen fluoride with a member of the class consisting of ketones, esters, ethers, alcohols, and nitriles and mixtures thereof in which the mol ratio of the organoaluminum compound/nickel compound ranges from about 0.3/1 to about 300/1, the mol ratio of the HFC/nickel compound ranges from about 2/1 to about 300/1 and the mol ratio of the HFC/organoaluminum compound ranges from about 0.2/1 to about 15/1.

3,856,765

FUNCTIONALLY SUBSTITUTED TERPOLYMERS OF ALPHA-OLEFINS

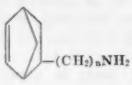
John Wilfred Collette, 1235 Faun Road Graylyn Crest; Rolland Shih-Yuan Ro, 1208 Lakewood Dr., and Fred Max Sonnenberg, 1423 Carson Rd., Green Acres, all of Wilmington, Del. 19803

Division of Ser. No. 829,758, June 2, 1969, Pat. No. 3,796,687. This application Apr. 27, 1973, Ser. No. 355,010

Int. Cl. C08f *15/40*

U.S. Cl. 260—80.73 1 Claim

1. An addition copolymer of (1) ethylene, (2) an α-olefin having 3–18 carbon atoms, and (3) and unsaturated functional monomer having the formula



where n is an integer within the range 0–20.

3,856,766

PROCESS FOR THE MANUFACTURE OF A LIGHT COLORED THERMOSTABLE CHLORINATED POLYOLEFIN

Helmut Klug, Aystetten; Ambar Nath Mukerjee, Geusthofen both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt/main, Germany

Filed Dec. 13, 1973, Ser. No. 424,226

Claims priority, application Germany, Dec. 21, 1972, 2262536

Int. Cl. C08f *27/03*

U.S. Cl. 260—88.2 3 Claims

1. A process for the manufacture of a light colored thermostable chloropolyolefin by chlorinating pulverulent polyethylene, polypropylene or a copolymer of ethylene with a straight chain or branched α-olefin having 3 to 6 carbon atoms, the molecular weight of the polymer being in the range of from about 20,000 to 2,000,000, with gaseous chlorine in a fluidized or moving bed, which comprises carrying out the chlorination with gaseous chlorine containing 0.01 to 1.5% by weight of steam.

3,856,767

POLYMERISATION PROCESS

Alan Charles Sturt, 10 Cunningham Ave., Guildford, Surrey, England

Filed Apr. 18, 1972, Ser. No. 245,193

Claims priority, application Great Britain, Apr. 21, 1971, 10396/71

Int. Cl. C08f *1/04, 1/11*

U.S. Cl. 260—92.8 R 7 Claims

1. A process for the production of a vinyl chloride polymer containing a major proportion of vinyl chloride which comprises adding a seed vinyl chloride polymer or copolymer containing a major proportion of vinyl chloride in a finely divided form having an average particle size of less than 200 μm and having an order factor above 16 or below 10, said seed polymer not having been prepared by a process defined in this claim, to vinyl chloride monomer and polymerising at a temperature in the range of 30°–80°C the vinyl chloride monomer in suspension or in mass using a free radical polymerisation initiator with said seed polymer or copolymer dispersed therein to produce a vinyl chloride containing polymer having an order factor above 16 or below 10, respectively, the weight ratio of said seed polymer or copolymer to vinyl chloride containing monomer being in the range of 0.1 : 99.9 to 50 : 50.

3,856,768

SODIUM OR POTASSIUM HYDROCARBON COMPOUND AND A CROWN ETHER AS A CATALYST COMPOSITION FOR POLYMERIZATION OF CONJUGATED DIENES

Adel F. Halasa, Bath, and Tai Chun Cheng, Akron, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Feb. 26, 1973, Ser. No. 335,962

Int. Cl. C08d *3/06*

U.S. Cl. 260—94.2 M 17 Claims

1. A process for the hydrocarbon solution polymerization of a monomer composition containing at least 70 percent conjugated diene comprising the step of maintaining said monomer composition at a temperature of −50° to 150°C in intimate contact with a catalyst composition consisting essentially of:
a. a sodium or potassium alkyl having 1–10 carbon atoms; and
b. a crown ether consisting essentially of a heterocyclic structure of at least 3 oxygen atoms and aliphatic or aromatic hydrocarbon radicals, adjacent oxygen atoms in said heterocyclic structure being separated from and joined to each other by at least two carbon atoms of said hydrocarbon radicals and, where cycloaliphatic or aromatic rings are present, oxygen atoms in said heterocyclic structure are attached to adjacent carbon atoms in said rings;
the concentration of said catalyst composition being 1–10 millimoles of sodium or potassium alkyl per 100 grams of said monomer composition, said crown ether being present in said catalyst composition in a ratio of 0.01–1.0 mole per mole of sodium or potassium alkyl, said polymerization being conducted for a period of at least 2 hours.

3,856,769

METHOD FOR PREPARING BIOLOGICALLY ACTIVE (PYRO) GLUTAMYL-HISTIDYL-TRYPTOPHYL-SERYL-YROSYL-GLYCYL-LEUCYL-ARGINYL-PROLYL-GLYCINE AMIDE

Shunpei Sakakibara, No. 23-3, Fujishirodai 2-chome, Suita-shi, Osaka; Yuichi Kumahara, No. 22-10, Takarayama-machi, Toyonaka-shi, Osaka, and Terutoshi Kimura, No. 14-3-102, Ohara-machi, Ashiya-shi, Hyogo, all of Japan

Filed Sept. 5, 1972, Ser. No. 286,394

Claims priority, application Japan, Sept. 2, 1971, 46-67745

Int. Cl. C07c *103/52*; C07g *7/00*; A61k *27/00*

U.S. Cl. 260—112.5 1 Claim

1. A method for preparing biologically active (pyro)glutamyl-histidyl-tryptophyl-seryl-tyrosyl-glycyl-leucyl-arginyl-prolyl-glycine amide which comprises reacting an oligopeptide fragment identified as (I) with an oligopeptide fragment identified as (II), each of which are prepared according to the synthesis described below, to form the heptapeptide, seryl-tyrosyl-glycyl-leucyl-arginyl-prolyl-glycine amide having some corresponding protective groups thereon, and coupling the resulting heptapeptide with protected tryptophane, histidine and (pyro)glutamic acid in turn at the nitrogen terminal of the each resulting peptide by stepwise elongation to result in a protected decapeptide, and then removing all the protective groups by treating the protected decapeptide with hydrogen fluoride:

Fragment (I):

Leucyl-(N-protected)arginyl-prolyl-glycineamide is prepared by coupling protected arginine with proline whose carboxyl group is protected, to produce arginylproline, coupling glycine amide with the resulted arginyl-proline to produce arginyl-prolyl-glycine amide and further coupling leucine with the α-nitrogen terminal of the resulting tripeptide and then removing only the protective group on the nitrogen terminal of the leucine portion, and

Fragment (II):

(N- and O-protected)seryl-(O-protected)tyrosyl-glycine is prepared by coupling a lower alkyl ester of glycine to result in a corresponding seryl-tyrosyl-glycine lower alkyl

ester and hydrolyzing only the ester bond of the tripeptide, thus formed.

3,856,770

PSYCHOPHARMACOLOGICALLY ACTIVE TETRA-, PENTA-, HEXA-, AND HEPTAPEPTIDES

Hendrik Marie Greven, Heesch, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

Filed Mar. 2, 1973, Ser. No. 337,507

Claims priority, application Netherlands, Mar. 8, 1972, 72.0342

Int. Cl. C07c *103/52*; **A61k** *27/00*

U.S. Cl. 260—112.5 **4 Claims**

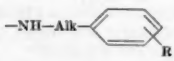
1. A peptide of the formula:

A—L—Glu(X)—L—His—L—Phe—Q—Y

in which A is selected from the group consisting of H—L—Met, H—D—Met, H—L—Met (→ O), H—D—Met (→ O), H—L—Met (→ O_2), H—D—Met (→ O_2), desamino-Met, desamino —Met (→ O), desamino-Met (→ O_2), and the moeity: $H_2N—B—CO$, in which B is alkylene having 1–6 carbon atoms,

X is selected from the group consisting of OH and NH_2,

Q is selected from the group consisting of L—Arg and L—Lys, and Y is selected from the group consisting of L—Phe—OH, L—Phe—Gly—OH, and (N-phenyl-alkyl) amino of the formula



in which ALK is alkylene with 1–6 carbon atoms and R is selected from the group consisting of hydrogen and hydroxy, and functional derivatives of said peptide selected from the group consisting of pharmaceutically acceptable acid addition salts, derivatives in which one or more free amino groups are substituted by acyl derived from an aliphatic carboxylic acid with 1–6 carbon atoms, unsubstituted amides or lower alkyl (1–6 C) substituted amides of those peptides having a free carboxyl group, esters derived from aliphatic or araliphatic alcohols with 1–18 carbon atoms, and metal complexes thereof.

3,856,771

PROCESS FOR MANUFACTURING ALKALI METAL OR AMMONIUM INSULIN

Richard L. Jackson, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

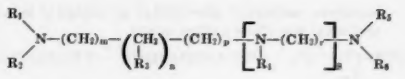
Filed July 16, 1973, Ser. No. 379,695

Int. Cl. C07c *103/52*; **C07g** *7/00*; **A61k** *17/02*

U.S. Cl. 260—112.7 **8 Claims**

1. A process for preparing an alkali metal or ammonium insulin, which comprises the steps of:

A. preparing an alkaline aqueous solution of a divalent metal insulin, a divalent metal ion chelating agent, and alkali metal or ammonium ions, wherein the concentration of divalent metal insulin is in the range of from about 10 to about 1,000 U/mg, the divalent metal is selected from the group consisting of manganese, iron, cobalt, nickel, copper, zinc, and cadmium, the concentration of alkali metal or ammonium ions is in the range of from about 0.2 to about 1.0 M, the pH of the solution is in the range of from about 7.6 to about 8.6, the concentration of chelating agent is in the range of from about 0.0002 to about 0.05 M, the molar ratio of chelating agent to divalent metal in the divalent metal insulin is at least about 3:1, and the chelating agent has the general formula,



wherein R_1 and R_5 are monovalent organic radicals independently selected from the group consisting of carboxymethyl, carboxyethyl, C_1–C_6 alkyl, and C_1–C_6 hydroxyalkyl; R_2 and R_6 are monovalent organic radicals independently selected from the group consisting of carboxymethyl and carboxyethyl; R_3 is a monovalent radical selected from the group consisting of hydrogen, hydroxy, and C_1–C_6 alkyl; R_4 is a monovalent radical selected from the group consisting of hydrogen, carboxymethyl, and carboxyethyl; *m* is an integer from 1 to 6, inclusive; *n* is an integer which is either 0 or 1; *p* is an integer which is either 0 or 1; *r* is an integer from 2 to 6, inclusive; and *s* is an integer from 0 to 2, inclusive; and

B. crystallizing the alkali metal or ammonium insulin.

3,856,772

AZO DYES OF THE DIAMINO PYRIMIDINE SERIES

Guenter Dunkelmann, and Johannes Dehnert, both of Ludwigshafen, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed Jan. 19, 1973, Ser. No. 325,216

Int. Cl. C09b *29/36*, *31/14*

U.S. Cl. 260—154 **10 Claims**

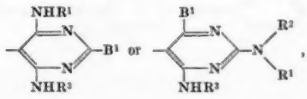
1. A dye of the formula

D—N=N—A

wherein:

D is phenyl substituted by chlorine, bromine, trifluoromethyl, methyl, methoxy, nitro, cyano, methylsulfonyl, ethylsulfonyl, phenylsulfonyl, carbalkoxy of a total of 2 to 5 carbon atoms, carbo-β-hydroxyethoxy, carbo-β-alkoxyethoxy in which said alkoxy has 1 to 4 carbon atoms, or N,N-dialkyl-substituted sulfamoyl in which each alkyl has 1 to 3 carbon atoms, with the proviso that at least one phenyl substituent is an electron-attracting substituent; phenylazophenyl; phenylazophenyl substituted by methyl, chlorine, bromine or nitro; benzthiazolyl; benzthiazolyl substituted by nitro, cyano, methylsulfonyl or ethylsulfonyl; benzisothiazolyl substituted by chlorine, bromine, cyano or nitro; thiazolyl substituted by cyano or nitro; thienyl substituted by methyl, cyano, nitro or carbalkoxy of a total of 2 to 5 carbon atoms; or thiadiazolyl substituted by phenyl, methyl, chlorine, bromine, methylmercapto, ethylmercapto or alkoxycarbonylethylmercapto, said alkoxy having 1 to 4 carbon atoms;

A is



B^1 is hydrogen, methyl, ethyl, propyl, butyl, α-ethylpentyl, benzyl, phenyl or phenyl substituted by methyl, ethyl, methoxy, ethoxy, chloro or nitro;

R^1 is hydrogen, alkyl of one to eight carbon atoms, cyanoalkyl of two to seven carbon atoms, hydroxyalkyl of two to nine carbon atoms, alkoxyalkyl of a total of three to 13 carbon atoms, cyclohexyloxypropyl, benzyloxypropyl, β-phenylethoxypropyl, phenoxyethyl, phenoxypropyl, phenyl, phenyl substituted by hydroxy, chloro, methyl, ethyl, β-hydroxyethyl, methoxy, ethoxy, β-hydroxyethoxy, cyano or dialkylamino in which each alkyl has 1 to 2 carbon atoms, cycloalkyl of 5 to 8 ring

members, norbornyl, phenylalkyl or tolylalkyl in which said alkyl has 1 to 4 carbon atoms,

$-CH_2-CH(OH)-C_4H_9$, $-CH_2CH_2OCH_2CH_2OH$, $-(CH_2)_3O(CH_2)_2OH$,

$-(CH_2)_3O(CH_2)_4OH$, $-(CH_2)_3O(CH_2)_6OH$, $-(CH_2)_3(OCH_2CH_2)_mOT$,

$-(CH_2)_3(OCH(CH_3)-CH_2)_mOT$, $-CH_2COOE$, $-CH_2CH_2COOE$,

$-(CH_2)_3COOE$, $-CH_2CH_2OCOCH_2CH_2COOE$,

$-CH_2CH_2-O-$acyl, $-(CH_2)_3-O-$acyl, $-CH_2-CH(CH_3)-O-$acyl,

$-(CH_2)_4-O-$acyl, $-CH_2CH_2-OCH_2CH_2-O-$acyl,

$-(CH_2)_3O(CH_2)_4O-$acyl, or $-(CH_2)_n-N$(=O)

E is hydrogen, alkyl of 1 to 3 carbon atoms, benzyl, β-hydroxyethyl, ω-hydroxyhexyl, δ-hydroxybutyl, β-methoxyethyl, γ-methoxypropyl, γ-ethoxypropyl, β-phenoxyethyl or β-hydroxyethoxyethyl,

acyl is CHO—, CH_3CO—, CH_3COCH_2CO—, $C_6H_5OCH_2CO$—, $C_6H_5CH_2CO$— or C_6H_5CO—,

m is 1 or 2

n is 2, 3 or 6,

T is hydrogen, alkyl of 1 to 4 carbon atoms, cyclohexyl, benzyl, phenylethyl or phenyl;

R^2 is hydrogen or alkyl of 1 to 8 carbon atoms;

R^3 has the same meanings given for R^1; and

R^1 and R^2 together with the nitrogen may also be pyrrolidino, piperidino, morpholino, piperazino, N-methylpiperazino or N-β-hydroxyethylpiperazino,

with the proviso that one of R^1, R^2 or R^3 is different from hydrogen.

3,856,773
WATER INSOLUBLE 4-(2'-CYANO-4'-NITROPHENYLAZO)-2-CHLORO-N-(B-YANOETHYL)-ANILINE

Ernst Hoyer, and Hans Jakob Schladetsch, both of Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

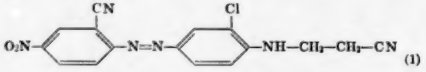
Filed July 25, 1972, Ser. No. 274,837

Claims priority, application Germany, July 27, 1971, 2137500

Int. Cl. C09b *29/08*

U.S. Cl. 260—205 **1 Claim**

1. The water-insoluble azo-dyestuff of the formula



(1)

3,856,774
MICROBIAL SYNTHESIS FROM ALDEHYDE CONTAINING HYDROCARBON DERIVED PRODUCTS

Donald O. Hitzman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 167,177, July 29, 1971, abandoned, which is a division of Ser. No. 751,926, Aug. 12, 1968, Pat. No. 3,642,578. This application June 4, 1973, Ser. No. 366,563

Int. Cl. C12d *13/00*

U.S. Cl. 260—209 R **1 Claim**

1. A polymeric gum possessing adhesive and water viscosifying qualities produced by a process of microbial synthesis of cellular production products from oxygenated hydrocarbon feedstock containing aldehydes in addition to other oxygenated hydrocarbons, which process comprises the steps of:

a. adding to said oxygenated hydrocarbon feedstock containing aldehydes at least one nitrogen-containing compound reactive with said aldehydes whereby said aldehydes are rendered substantially innocuous,

b. culturing oxygenated hydrocarbon-utilizing microorganisms on said nitrogen-containing compound treated feedstock from said step(a), thereby producing said polymeric gum,

wherein said microorganism is selected from the group of genuses Pseudomonas, Methanomonas, Arthobacter, Corynebacterium, Bacillus, Mycobacterium, Actinomyoes, Norcardia, Micrococcus, Rhodobacillus, Chromatium, Serratia, Rhizobium, Aerobacter, Escherichia, and Streptococcus.

3,856,775
β-(1→3)-GLUCANS

Fumiko Fukuoka, Tokyo; Goro Chihara, Saitama-ken, and Junji Hamuro, Tokyo, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 53,470, July 9, 1970, abandoned. This application Aug. 17, 1972, Ser. No. 281,425

Claims priority, application Japan, July 14, 1969, 44-55612

Int. Cl. C07g *3/00*

U.S. Cl. 260—209 R **2 Claims**

1. A β-(1 → 3)-glucan of the formula

$$D-G_p-[(1 \rightarrow 3)-(\beta-D-G_p)]_o-O-CHR_1-CHOH-CH_2OH$$

wherein R_1 is hydroxymethyl or hydrogen, G_p is glucopyranosyl, and *o* is an integer and at least 60.

3,856,776
DERIVATIVES OF CYCLO ADENOSINE-3 -,5 -PHOSPHORIC ACID AND THEIR PREPARATION

Georges Cehovic, Val de Marne, France; Albert Gabbai; Ilan Marcus, and Theodore Posternak, all of Geneva, Switzerland, assignors to Agence Nationale De Valorisation De La Recherche, Towe Aurare, Paris-Defense, Courbevaie, Hauts de Seine, France

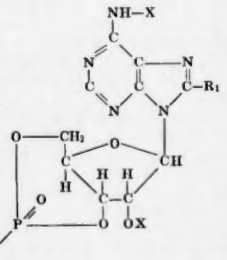
Filed Oct. 12, 1970, Ser. No. 80,223

Claims priority, application France, Oct. 10, 1969, 69.34747; Oct. 2, 1970, 70.35682

Int. Cl. C07d *51/54*

U.S. Cl. 260—211.5 R **16 Claims**

1. Compounds having the structural formula



wherein X is selected from the group consisting of butyryl and H with the provisio that at least one X must be butyryl; R_1 is selected from the group consisting of SH, Br, OH, SCH_3 and NH_2; and their neutralization salts.

3,856,777

METHOD OF PRODUCING PYRIMIDINE NUCLEOSIDE DERIVATIVES

Yoshiharu Ishido, Kanagawa-ken; Teruo Yoshino, Saitama-ken; Hajime Komura; Katsumi Suzuki, both of Tokyo; Akihiro Yamasaki, and Masaru Okutsu, both of Kanagawa-ken, all of Japan, assignors to Ajinimoto Co., Inc., Tokyo, Japan

Filed Dec. 11, 1972, Ser. No. 313,936

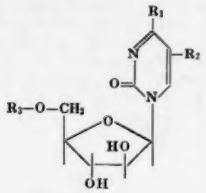
Claims priority, application Japan, Dec. 14, 1971, 46-101289

Int. Cl. C07d *51/52*

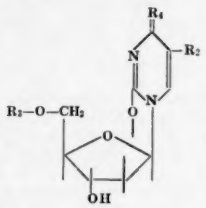
U.S. Cl. 260—211.5 R 4 Claims

1. A method of producing a pyrimidine derivative which comprises:

reacting a compound of the formula



with an approximately equivalent amount of a cyclic alkylene or alkylenyl ester of carbonic acid at approximately 100° to 200°C until a 2,2′-anhydro derivative of said compound is formed, said anhydro derivative being of the formula



in said formulas: R_1 being hydroxy, mercapto, amino, acetylamino, or monoalkylamino,

R_2 being hydrogen, hydroxy, halogen, or alkyl,

R_3 being hydrogen, alkanoyl, or H_2PO_3, and R_4 being oxygen, sulfur, imino, acetylimino, or alkylimino,

said alkyl, alkanoyl, alkylene, and alkylenyl having not more than four carbon atoms.

3,856,778

PHARMACEUTICALLY ACTIVE NEW GUANIDINO-ALKYLCYCLO-IMINES

Jozsef Rakoczi, 17 Felvinczi uta,, Budapest II; Ivan Beck, 27, Nepkoztarsasag ut, Budapest VI, both of Hungary; Endre Komlos, deceased, late of 1 Kando ku, Budapest II, Hungary (by Anna Komlos nee Kiss, administratrix); Lujza Petocz, 2 Rakoczi ter, Budapest VIII, and Katalin Grasser, 30 Ferenc Korut, Budapest IX, both of Hungary

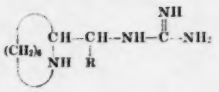
Continuation of Ser. No. 34,901, May 5, 1970, abandoned, which is a continuation-in-part of Ser. No. 691,131, Dec. 18, 1967, abandoned. This application July 18, 1973, Ser. No. 380,175

Claims priority, application Hungary, Dec. 30, 1966, OE 132

Int. Cl. C07d *41/00*

U.S. Cl. 260—239 B 1 Claim

1. A compound of the formula



or pharmaceutically acceptable acid addition salts thereof, wherein R stands for hydrogen or methyl.

3,856,779

PROCESS FOR THE PREPARATION OF SODIUM SALT OF AMPICILLIN

Dennis Edward Clark, 239D Blossom Dr., R.D. No. 1, Basking Ridge, N.J. 07920, and Robert Christopher Hutton, 17 Withdean Ave., Goring, England

Continuation of Ser. No. 145,512, May 20, 1971,. This application Feb. 23, 1973, Ser. No. 335,359

Claims priority, application Great Britain, Mar. 3, 1966, 9260/66

Int. Cl. C07d *99/16*

U.S. Cl. 260—239.1 5 Claims

1. A process for the preparation of the sodium salt of the D-(-)-epimer of α-aminobenzylpenicillin which comprises forming a solution of the diethylamine salt of the said penicillin in methylene dichloride with only a small excess of diethylamine over the stoichiometric requirement and recovering the sodium salt of the said penicillin precipitated therefrom upon the addition of a sodium or sodio precipitant.

3,856,780

SYNTHESIS OF 25-HYDROXYCHOLESTEROL AND DERIVATIVES THEREOF

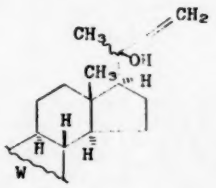
Thomas Albert Narwid, 7 Brooklawn Dr., Pompton Plains, N.J. 07444, and Milan Radoje Uskokovic, 253 Highland Ave., Upper Montclair, N.J. 07043

Continuation-in-part of Ser. No. 371,091, June 18, 1973,. This application Oct. 23, 1973, Ser. No. 408,788

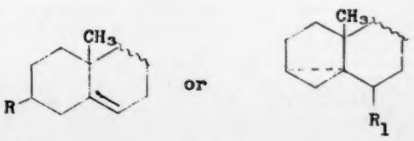
Int. Cl. C07c *173/00, 169/48*

U.S. Cl. 260—239.55 R 31 Claims

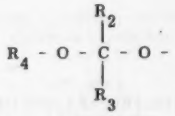
1. A compound of the formula



wherein W is one of the partial formulas



and R is hydroxy, tertiary lower alkoxy, benzyloxy, diphenylmethoxy, trityloxy, lower alkanoyloxy, benzoyloxy, acetoacetoxy, or a group of the formula



wherein R_2 is hydrogen or lower alkyl, R_3 and R_4 taken independently are each lower alkyl and R_3 and R_4 taken together are lower alkylene of from 3 to 6 carbon atoms; and R_1 is hydroxy, lower alkoxy, phenyl lower alkoxy, lower alkanoyloxy, benzoyloxy or acetoacetoxy.

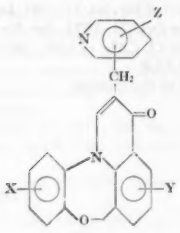
3,856,781

2-PYRIDYLMETH YL-3H,7H-QUINO(8,1-CD)(1,5)BENZOXAZEPIN-3-ONE COMPOUNDS

Harry Louis Yale, New Brunswick, N.J., and Ramesh B. Petigara, Lansdale, Pa., assignors to E. R. Squibb and Sons, Inc., Princeton, N.J.

Filed May 23, 1973, Ser. No. 363,201
Int. Cl. C07d *39/00*
U.S. Cl. 260—240 R **10 Claims**

1. A compound of the formula:



wherein Z is selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, bromo and chloro and (lower alkyl)$_2$amino-lower alkoxy and X and Y are selected from the group consisting of hydrogen, chloro, bromo, trifluoromethyl, (lower alkyl)$_2$sulfonamido, lower alkyl and lower alkoxy, with the provisio that at least one member selected from the group consisting of X and Y is hydrogen; and pharmaceutically acceptable acid addition salts thereof.

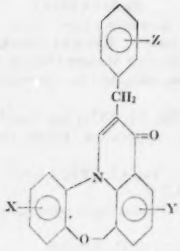
3,856,782

2-BENZYL-3H,7 H-QUINO(8,1-CD)(1,5)BENZOXAZEPIN--ONE

Harry Louis Yale, New Brunswick, N.J., and Ramesh B. Petigara, Lansdale, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 23, 1973, Ser. No. 363,202
Int. Cl. C07d *39/00*
U.S. Cl. 260—240 F **14 Claims**

1. A compound of the formula:



wherein Z is selected from the group consisting of hydrogen, halo, trifluoromethyl, lower alkyl, lower alkoxy, di(lower alkoxy), tri(lower alkoxy), (lower alkyl)$_2$amino and (lower alkyl)$_2$amino-lower alkoxy and X and Y are selected from the group consisting of hydrogen, chloro, bromo, trifluoromethyl, (lower alkyl)$_2$sulfonamido, lower alkyl and lower alkoxy, with the provisio that at least one member selected from the group consisting of X and Y is hydrogen.

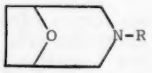
3,856,783

8-OXA-3-AZABI CYCLO(3.2.1)OCTANE COMPOUNDS

Alfred D. Miller, Wilmington, Del., assignor to ICI United States Inc., Wilmington, Del.

Filed June 14, 1973, Ser. No. 370,011
Int. Cl. C07d *87/28*
U.S. Cl. 260—240 D **31 Claims**

1. A compound represented by the formula



wherein R is a radical selected from the group consisting of benzyl; phenyl; aminoalkyl ($C_1$to C_6); dimethylaminoalkyl (C_1 to C_6); phenylacetyl; quinoxaloyl; mono-, di-, or tri-alkoxy (C_1 to C_4) substituted benzoyl; phenylalkyl where the alkyl constituent thereof contains from 1 to 4 carbon atoms; alkenyl (C_3); mono-, di-, or tri-halogen substituted phenylalkyl where the alkyl group contains from 1 to 4 carbon atoms and the halogen is substituted on the phenyl ring; guanadionalkyl (C_1 to C_4); mono-, di-, or tri-halogen substituted benzoyl; di- or tri-alkyl (C_1 to C_4) substituted benzoyl; mono-, di-, or trihalogen substituted phenylalkanoyl wherein the alkanoyl group contains from 2 to 4 carbon atoms and the halogen is on the phenyl ring; hexahydrobenzoyl; phenylalkenoyl wherein the alkenoyl group is a lower alkenoyl containing from 3 to 5 carbon atoms; phenylalkanoyl wherein the alkanoyl group contains from 2 to 4 carbon atoms; o- and p-alkyl (C_1 to C_4) substituted phenylalkanoyl where the alkanoyl group contains 2 to 4 carbon atoms and the alkyl group is substituted on the phenyl ring; alkyl (C_1 to C_4) substituted naphthylalkanoyl wherein the alkanoyl group contains 2 to 4 carbon atoms and the alkyl group or groups are attached to the naphthyl ring; alkanoyl (C_4 to C_{18}); haloalkyl (C_1 to C_4) mono-, di-, or tri-substituted benzoyl wherein the haloalkyl group contains from 1 to 5 halogen atoms; mono-, di-, or tralkoxy (C_1 to C_4) substituted phenylalkyl wherein the alkyl group contains 1 to 4 carbon atoms and the alkoxy is substituted on the phenyl ring; thienylalkyl wherein the alkyl group contains from 1 to 4 carbon atoms; anilinocarbonyl; adamantanecarbonyl; phenylsulfonyl; mono- or di-carboxyl substituted benzoyl; mono- or di-hydroxyl substituted benzoyl; nicotinoyl; mono- or di-alkanoyloxy (C_2 to C_4) substituted benzoyl; thenoyl; phenylglyoxylyl; cycloalkyl (C_4 to C_8); N-(alkylene [C_1 to C_8] α,ω-dicarbonyl)-8-oxa-3-azabicyclo(3.2.1)octane; N-(alkylene [C_1 to C_8])-8-oxa-3-

azabicyclo(3.2.1)octane; N-(terephthaloyl)-8-oxa-3-azabicyclo(3.2.1)octane; and the pharmacologically acceptable acid addition salts thereof.

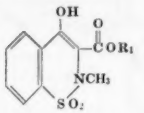
3,856,784

ALKYLAMINOALKYL 4-HYDROXY-2-METHYL-2H-1,2-ENZOTHIAZINE-3-CARBOXYLATE 1,1-DIOXIDES AND N-ALKYLAMINOALKYL-4-HYDROXY-2-METHYL-2H-1,2-BENZOTHIAZINE-3-CARBOXAMIDE 1,1-DIOXIDES

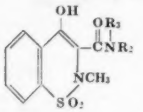
Harold Zinnes, Rockaway; Jagadish C. Sircar, Dover, and John Shavel, Jr., Mendham, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Nov. 16, 1971, Ser. No. 199,342
Int. Cl. C07d *93/02*
U.S. Cl. 260—243 R **15 Claims**

1. A member selected from a group consisting of compounds of the formula:



I



II

wherein R_1 is dialkylaminoalkyl; R_2 is a member selected from a group consisting of dialkylaminoalkyl and monoalkylaminoalkyl and R_3 is a member selected from a group consisting of hydrogen and alkyl in which alkyl has 1–7 carbon atoms.

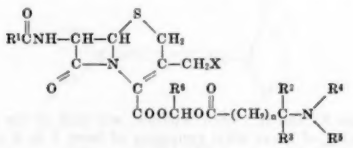
3,856,785

CEPHALOSPORIN ESTERS

Hermann Breuer, Regensburg, Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed July 24, 1972, Ser. No. 274,362
Int. Cl. C07d *99/24*
U.S. Cl. 260—243 C **6 Claims**

1. A compound of the formula



wherein R^1 is thienylmethyl, α-ureidothienylmethyl, or furylmethyl; R^2 and R^6 each is hydrogen, lower alkyl or phenyl-lower alkyl; R^3, R^4 and R^5 each is hydrogen or lower alkyl; X is hydrogen, hydroxy or lower alkanoyloxy; and *n* is 0 to 5.

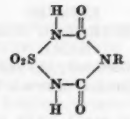
3,856,786

SULFONYLDIISOCYANATE ADDUCTS

Ludwig Konrad Huber, King of Prussia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed July 25, 1972, Ser. No. 274,926
Int. Cl. C07d *93/00*
U.S. Cl. 260—243 R **4 Claims**

1. The cyclic compound represented by the structure



where R is selected from the group consisting of alkyl having one to 20 carbon atoms, aryl having six to 18 carbon atoms, alkylaryl having from seven to 20 carbon atoms, amino, aminoalkyl having up to 20 carbon atoms, aminoaryl having six to 18 carbon atoms, aminoalkylaryl having seven to 20 carbon atoms, and aminoarylalkyl having seven to 20 carbon atoms.

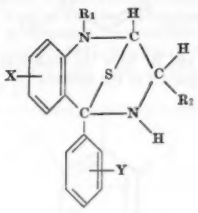
3,856,787

1-SUBSTITUTED-2-THIO-1H-1,4-BENZODIAZEPINES

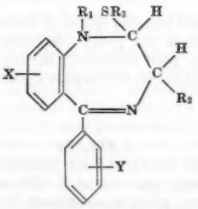
Martin Steinman, Livingston, N.J., assignor to Schering Corporation, Bloomfield, N.J.

Filed Sept. 14, 1972, Ser. No. 289,023
Int. Cl. C07d *53/06*
U.S. Cl. 260—243 R **9 Claims**

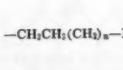
1. A 1-substituted-2-thio-1H-1,4-benzodiazepine selected from the group represented by formula I:



and formula II:



wherein X is halogen, trifluoromethyl or nitro; R_1 is lower alkyl, polyfluoro-lower alkyl or phenyl-lower alkyl; R_2 is hydrogen or lower alkyl; R_3 is lower alkyl or



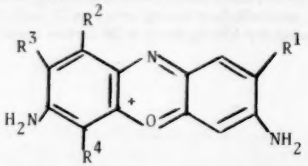
where n is 0 or 1 and R_6 and R_7 are each hydrogen or lower alkyl; Y is hydrogen, halogen or lower alkyl; and the 4-N-oxides and the pharmaceutically acceptable acid addition salts thereof.

3,856,788
DYESTUFF AND METHOD OF MAKING AND USING SAME

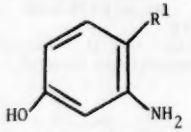
John Frank Corbett, Glenview, Ill., and Allen G. Fooks, Filehurst, Reading, England, assignors to The Gillette Company, Boston, Mass.

Division of Ser. No. 135,495, April 19, 1971, abandoned. This application June 26, 1972, Ser. No. 266,249
Int. Cl. C09b *19/00*
U.S. Cl. 260—244 R **4 Claims**

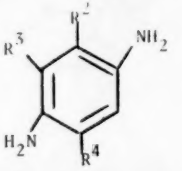
1. A process for the preparation of a 3,7-diaminophenoxazinium salt of the formula



in which R^1 is an alkyl group having from 1 to 4 carbon atoms, R^2, R^3 and R^4, which may be the same or different, are selected from the group consisting of hydrogen, chlorine, bromine and an alkyl group having from 1 to 4 carbon atoms, and X is an anion, which process comprises preparing a solution containing dissolved
in a solvent inert to the reactants a mixture of a p-phenylenediamine of the formula



in which R^2, R^3 and R^4 have the meanings specified above, 3-amino-4-alkyl-phenol of the formula



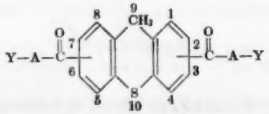
in which R^1 has the meaning specified above, and an oxidizing agent selected from the group consisting of ferricyanides, dichromates and permanganates, heating said solution to cause oxidation to occur, then separating the product from the solution.

3,856,789
BIS-BASIC KETONES OF THIOXANTHENE

Robert W. Fleming, and Arthur D. Sill, both of Cincinnati, Ohio, assignors to Richardson-Merrell, Inc., New York, N.Y.

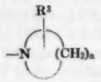
Filed Apr. 23, 1971, Ser. No. 137,055
Int. Cl. A61k *27/00*; **C07d** *87/34*
U.S. Cl. 260—246 B **16 Claims**

1. A compound selected from a base of the formula



wherein A is a straight or branched alkylene chain having from 1 to 6 carbon atoms; and each Y is
A. the group

wherein R^1 and R^2 are individually hydrogen, allyl or lower alkyl having from 1 to about 4 carbon atoms; or
B. the group



wherein *n* is a whole integer of 4 or 5, and R^3 is hydrogen or lower alkyl having from 1 to about 4 carbon atoms and can be linked to any one of the carbon atoms of the heterocyclic group; or
C. the group

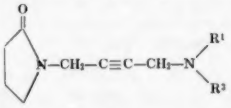
wherein X is oxygen or NR^4, and R^4 is hydrogen or lower alkyl of from 1 to about 4 carbon atoms;
or a pharmaceutically acceptable acid addition salt thereof.

3,856,790
CYCLIC AMIDES OF 1,4-DIAMINOBUT-2-YNE

Meier E. Freed, Philadelphia, Pa. and John L. Archibald, Windsor, England. Assignor: American Home Products Corporation, New York, N.Y.

Continuation of Ser. No. 1,021, Jan. 6, 1970, abandoned, which is a continuation-in-part of Ser. No. 599,408, Dec. 16, 1966, abandoned. This application Sept. 18, 1972, Ser. No. 291,692
Int. Cl. C07d *87/42*
U.S. Cl. 260—247.2 A **4 Claims**

1. A compound of the group having the formula:



wherein R^1 and R^2, when separate, are each of the group consisting of lower alkyl consisting of from 1 to 4 carbon atoms and, when joined, complete a ring of the group consisting of piperidino and morpholino.

3,856,791
PREPARATION OF AMIDES

Francis A. Daniher, Darien, and Joel A. Zaslowsky, Olympia Fields, both of Ill., assignors to CPC International, Inc., Englewood Cliffs, N.J.

Filed Nov. 20, 1972, Ser. No. 308,213
Int. Cl. C07d *87/28*, *87/36*
U.S. Cl. 260—247.7 H **15 Claims**

1. A process for preparing amides comprising contacting phosgene with an organic carboxylic acid and an acid salt of an amine, wherein said acid has a pK_a value not substantially above about 6.

3,856,792
2-[2-(SUBSTITUTED AMINOMETHYL)-4H-1,2,4-TRIAZOL-4-YL]BENZOPHENONES

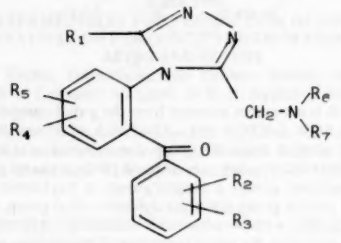
Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 240,756, April 3, 1972, abandoned, which is a continuation-in-part of Ser. No. 114,049, Feb. 9, 1971, Pat. No. 3,709,898. This application June 21, 1973, Ser. No. 372,313

Int. Cl. C07d *55/06, 57/00, 99/02*

U.S. Cl. 260—247.5 R **13 Claims**

1. A 2-[3-(substitutedaminomethyl)-4H-1,2,4-triazol-4-yl]benzophenone of the formula II:



II

wherein R_1 is selected from the group consisting of hydrogen and alkyl of 1 to 3 carbon atoms, inclusive and cyclopropyl; wherein R_2, R_3, R_4, and R_5 are selected from the group consisting of hydrogen, alkyl defined as above, fluorine, chlorine, bromine, nitro, trifluoromethyl, and alkylthio in which alkyl is defined as above; and wherein R_6 and R_7 are selected from the group consisting of hydrogen and alkyl of 1 to 5 carbon atoms, inclusive, with the proviso that only one of the parameters R_6 or R_7 can be hydrogen, or together the group

is a heterocyclic amino group selected from pyrrolidino, piperidino, morpholino, and hexamethyleneimino, and the pharmacologically acceptable acid addition salts thereof.

3,856,793
ALKYLOXALYL AMINO-S-TRIAZINES

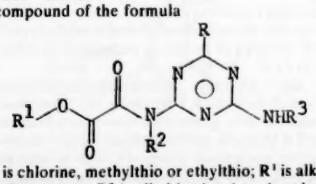
Alan A. MacDonald, Albany, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

Filed Apr. 2, 1973, Ser. No. 347,296

Int. Cl. C07d *55/20*

U.S. Cl. 260—249.8 **7 Claims**

1. A compound of the formula



where R is chlorine, methylthio or ethylthio; R^1 is alkyl having 1 to 4 carbon atoms; R^2 is alkyl having 1 to 4 carbon atoms; and R^3 is alkyl having 1 to 4 carbon atoms.

3,856,794
1-PHENOXY-3-ARYLPIPERAZINYL-2-PROPANOL HYPOTENSIVES

John Christopher Danilewicz, Ash; John Edward Glyn Kemp, Canterbury; Michael Snarey, Sandwich, and James Robert Wright, Deal, all of England, assignors to Pfizer Inc., New York, N.Y.

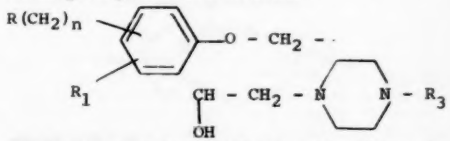
Filed Nov. 8, 1971, Ser. No. 196,729

Claims priority, application Great Britain, Nov. 10, 1970, 53303/70

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 PH **10 Claims**

1. A propanolpiperazine compound selected from the group consisting of organic bases of the formula



and the pharmaceutically acceptable acid addition salts thereof, wherein $R(CH_2)_n$ is at the 2- or 4-position on the phenyl ring; R of $R(CH_2)_n$ is carbamoyl and *n* is an integer of from one to two; inclusive; R_1 is hydrogen or a straight chain alkyl having from one to six carbon atoms; and R_3 is chlorophenyl or alkoxyphenyl having from one to six carbon atoms in the alkoxy moiety.

3,856,795
PROCESS FOR PREPARATION OF SECONDARY AMINES FROM TERTIARY AMINES

John P. Yardley, King of Prussia, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Apr. 25, 1972, Ser. No. 247,438

Int. Cl. C07b *1/00, 3/00*; **C07d** *41/08*

U.S. Cl. 260—283 SY **10 Claims**

1. A process of converting a tertiary amine of the formula:

wherein R^1 and R^2 are each a radical selected from the class consisting of an alkyl group of 1 through 12 carbon atoms, a cycloalkyl group having 4 through 10 ring carbon atoms, phenyl, naphthyl and phenyl(lower)alkyl; R^1 and R^2 when joined together form with the N-atom a member selected from the class consisting of piperidino, pyrrolidino, piperazino, morpholino, hexamethylenimino, decahydroquinolino, and 1,2,3,4,5,6-hexahydro-6,11-dimethyl-2,6-methano-3-benzazocino-8-methanol, said groups defined by R^1 and R^2 being optionally substituted with a member selected from the class consisting of hydroxy and (lower)-alkoxy; and R^3 is a member selected from the group consisting of allyl, dimethyl allyl, propargyl and benzyl; to a secondary amine of the formula:

which comprises reacting said tertiary amine with an organic peracid to form the N-oxide of said tertiary amine and reacting said N-oxide with an alkali metal in the presence of liquid ammonia to form the corresponding secondary amine by cleavage of said R^3 group from said tertiary amine, the reaction of said tertiary amine with said organic peracid being

carried out at a temperature between about −40°C. and about +32°C.

5. A process according to claim 1 wherein said tertiary amine is N-allyl dodecahydroquinoline.

9. A process according to claim 6 wherein said tertiary amine is benzyloxycarbonylemetine and the secondary amine obtained is 1',2',2' -secoemetine.

3,856,796
HYDROXYALKYL-SUBSTITUTED-AMINO-QUINOLINES AND NITRATES THEREOF

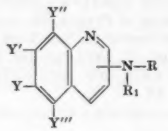
William R. Simpson, Mendham, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

Continuation-in-part of Ser. No. 245,308, April 19, 1972, abandoned, which is a continuation-in-part of Ser. No. 127,376, March 23, 1971, abandoned. This application Sept. 25, 1972, Ser. No. 291,833

Int. Cl. C07d *33/50*

U.S. Cl. 260—288 R **22 Claims**

1. A compound of the formula:

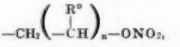


wherein

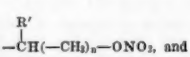
R is from the group of

a. $-CH_2(-CH_2)_n-ONO_2$

b)



c)



d. $-CH_2(-CH_2)_x-N[CH_2(-CH_2)_y-ONO_2]_2$

R_1 is from the group of

e. $-CH_2(-CH_2)_n-ONO_2$ when R is (a) as above defined,

f. hydrogen, and

g. alkyl of 1 to 4 carbon atoms,

R′ is $-(CH_2-)_xCH_3$ or $-(CH_2)_xONO_2$,

R^o is hydrogen, $-(CH_2-)_mCH_3$ or $-(CH_2-)_xONO_2$, provided that one R^o (and only one) is other than hydrogen, that the sum of *n* and *m* does not exceed 7 and that the sum of *n* and *y* does not exceed 8,

n is 1 to 7,

m is 0 to 4,

x is 0 or 1,

y is 1 to 4, and

each of Y, Y′, Y″ and Y‴ is hydrogen, halo of atomic weight of from 18 to 80, alkoxy of 1 to 3 carbon atoms or alkyl of 1 to 3 carbon atoms or Y and Y′ together form methylenedioxy, provided that at least 2 of Y, Y′, Y″ and Y‴ are hydrogen and further provided that when one of Y, Y′, Y″ and Y‴ is halo then the others are hydrogen; or a pharmaceutically acceptable acid addition salt thereof.

3,856,797
8-AMINOALKYL-3-OXO-1-THIA-4,8-DIAZASPIRO(4.5)DECANES AND ANALOGS THEREOF

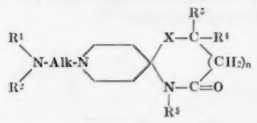
Katsuo Arimura; Toshihiro Kobayakawa, both of Yoshitomimachi; Hideki Ao, Nakatsu, and Yoshiaki Tsuda, Yoshitomimachi, all of Japan, assignors to Yoshitomi Pharmaceutical, Osaka, Japan

Filed Dec. 29, 1972, Ser. No. 319,808

Int. Cl. C07d *29/34*

U.S. Cl. 260—293.66 **13 Claims**

1. A compound of the formula:



wherein X is a member selected from the group consisting of —S—, —SO—, $-SO_2-$ and —O—; each of R^1 and R^2 is a member selected from the group consisting of a hydrogen atom, a lower alkyl group, a cyclohexyl group, a phenyl group, a chlorophenyl group, a benzyl group, a furyl-lower-alkyl group, a pyridyl group and a pyridyl-lower-alkyl group, or R^1 and R^2 together with the adjacent N atom form a heterocyclic ring selected from the group consisting of pyrrolidine, piperidine, morpholine, N′-methylpiperazine, N′-phenylpiperazine and N′-m-trifluoromethylphenylpiperazine; each of R^3 and R^4 is a member selected from the group consisting of a hydrogen atom, a lower alkyl group and a phenyl group; R^5 is a member selected from the group consisting of a hydrogen atom, a lower alkyl group, a phenyl group, a chlorophenyl group, a methoxyphenyl group, a tolyl group, a trifluoromethylphenyl group, a benzyl group, a furyl-lower-alkyl group and a pyridyl group; alk is an alkylene group having 1 to 4 carbon atoms; and *n* is a member selected from the group consisting of zero and 1; in which definitions the term "lower" in each occurrence means that the alkyl group or moiety recited has no more than 4 carbon atoms; or a pharmaceutically acceptable acid addition salt thereof.

3,856,798
BICYCLIC DERIVATIVES OF 1, 4- DIHYDROPYRIDINE

Horst Meyer; Friedrich Bossert, both of Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal-Vohwinkel, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

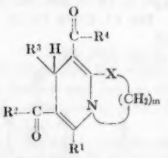
Filed Feb. 28, 1973, Ser. No. 336,477

Claims priority, application Germany, Sept. 12, 1972, 2210633

Int. Cl. C07d *31/50*

U.S. Cl. 260—294.8 C **16 Claims**

1. A compound of the formula:



wherein

X is —)— or —S—

m is 2, 3 or 4;

R^1 is hydrogen or lower alkyl;

each of R^2 and R^4, independent of the other, is lower alkoxy, lower alkoxy(lower alkyl) or alkynyloxy having 2 to 4carbon atoms; and

R^3 is lower alkyl; phenyl; phenyl substituted by one to three substituents selected from the group consisting of lower alkyl, trifluoromethyl, cyano, halo, nitro and carbo(lower alkoxy); pyridyl; furyl; thenyl; or naphthyl.

3,856,799

INTERMEDIATES FOR PRODUCTION OF AMINO DERIVATIVES OF PYRAZOLOPYRIDINE CARBOXYLIC ACIDS AND ESTERS

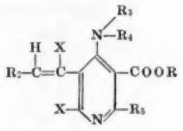
Hans Hoehn, Tegernheim, and Theodor Denzel, Nurnberg, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 169,536, Aug. 5, 1971, Pat. No. 3,755,340, which is a continuation-in-part of Ser. No. 41,568, May 28, 1970, abandoned. This application June 11, 1973, Ser. No. 368,802

Int. Cl. C07d *31/36*

U.S. Cl. 260—295.5 R **7 Claims**

1. A compound of the formula



wherein R is hydrogen or lower alkyl, R_2 is hydrogen or C_1 to C_3 alkyl, R_3 is hydrogen or lower alkyl, R_4 is hydrogen, lower alkyl, phenyl or phenyl-lower alkyl, R_5 is hydrogen or C_1 to C_3 alkyl and X is chlorine or bromine.

3,856,800

PROCESS OF PREPARING 1,4-DIHYDRO-4-OXO-7-Q-3-UNSUBSTITUTED-1,8-NAPHTHYRIDINES FROM CYCLIC ALKYLIDENYL N-(6-Q-2-PYRIDYL) AMINOMETHYLENEMALONATES

Robert K. Bair, Bethlehem, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Feb. 26, 1973, Ser. No. 335,733

Int. Cl. C07d *31/42*

U.S. Cl. 260—296 N **12 Claims**

1. The process which comprises reacting cyclic alkylidenyl N-(6-Q-2-pyridyl)aminomethylenemalonate with an oxidizing agent capable of converting pyridines to pyridine N-oxides to produce cyclic alkylidenyl N-(6-Q′-1-oxo-2-pyridyl)aminomethylenemalonate, heating said 1-oxo-2-pyridyl compound to produce 1,4-dihydro-4-oxo-7-Q′-1,8-naphthyridine-8-oxide and converting said 8-oxide to 1,4-dihydro-4-oxo-7-Q-1,8-naphthyridine, where Q is lower-alkyl, 4(or 3)-pyridyl or 4(or 3)-pyridyl having one or two lower-alkyl substituents and Q′ is lower-alkyl, 1-oxo-4(or 3)-pyridyl or 1-oxo-4(or 3)-pyridyl having one or two lower-alkyl substituents.

3,856,801

CERTAIN 6,7-DIHYDRO-PYRIDO[1,2-D][1,4,6]-BENZODIAZOCINES AND 6 H-PYRIDO[1,2-C][1,3,5]-BENZOXADIAZEPINES

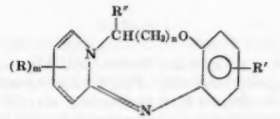
Harry Louis Yale, New Brunswick, and Ramesh B. Petigara, Somerset, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 4, 1973, Ser. No. 347,939

Int. Cl. C07d *31/42*

U.S. Cl. 260—296 H **2 Claims**

1. A compound of the formula



wherein *m* is 1 or 2

R is the same or different and is hydrogen, halogen (F, Cl, or Br), alkyl of from one to four carbons, alkoxy of from 1 to 4 carbons, alkylthio of from one to four carbons, benzyl, phenethyl, phenyl, phenoxy, phenylmercapto or mono-substituted phenyl wherein the substituent may be halogen (F, Cl, Br or I), alkyl of from one to four carbons, alkoxy of from 1 to four carbons, or trifluoromethyl; provided that when R is halogen, R occupies only the 3- or 5-position in the original 2-aminopyridine;

R′ is hydrogen, halogen (F, Cl, Br or I), alkyl of from one to four carbons, alkoxy of from one to four carbons, alkylmercapto of from one to four carbons, alkylsulfonyl wherein the alkyl radical has from one to four carbons, phenyl, phenyloxy, sulfamoyl, dialkylamidosulfonyl wherein each alkyl radical may have from one to four carbons, trifluoromethyl, mono-substituted phenyl or mono-substituted phenyloxy wherein the substituent may be halogen (F, Cl, Br or I), alkyl of from one to four carbons, alkoxy of from one to four carbons of trifluoromethyl; provided that R′ occupies the position para to the carbon atom joined to oxygen when R′ is alkylsulfonyl sulfamoyl, dialkylamidosulfonyl, phenyl, phenoxy, mono-substituted phenyl or mono-substituted phenoxy;

n is 0 or 1;

and R″ is hydrogen or alkyl of from one to four carbons, and pharmaceutically acceptable acid-addition salts thereof.

3,856,802

1,6-DISUBSTITUTED-4H-5-[4,3-A]BENZODIAZEPINES

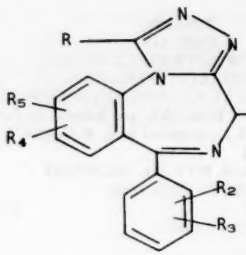
Jacob Szmuszkovicz, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 142,068, May 10, 1971, abandoned. This application July 19, 1973, Ser. No. 380,666

Int. Cl. C07d *57/02, 99/04, 99/06*

U.S. Cl. 260—296 T **10 Claims**

1. A compound selected from the group consisting of 1,6-disubstituted-4H-s-triazolo[4,3-a][1,4]benzodiazepine of the formula II



II

wherein R is an aromatic heterocyclic ring radical selected from the group consisting of 2-, 3-, and 4-pyridyl, 2-thienyl, and 2-furyl; wherein R_1 is hydrogen or alkyl of one to three carbon atoms, inclusive; and wherein R_2, R_3, R_4, and R_5 are selected from the group consisting of hydrogen, halogen, nitro, trifluoromethyl, and alkylthio in which alkyl is defined as above; the 5-N-oxides and the pharmacologically acceptable salts thereof.

3,856,803

2-(SUBSTITUTED AMINO)QUINOLIZINIUM BROMIDES

Robert J. Alaimo, and Marvin M Goldenburg, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Division of Ser. No. 278,618, Aug. 17, 1972,. This application Dec. 26, 1973, Ser. No. 430,945

Int. Cl. C07d *31/42*

U.S. Cl. 260—296 B **1 Claim**

1. The compound 2-[1-(2-hydroxyethyl)hydrazino]-6-methyl quinolizinium bromide.

3,856,804

2-(SUBSTITUTED AMINO)QUINOLIZINIUM BROMIDES

Robert J. Alaimo, and Marvin M. Goldenberg, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Division of Ser. No. 278,618, Aug. 17, 1972,. This application Dec. 26, 1973, Ser. No. 431,140

Int. Cl. C07d *31/42*

U.S. Cl. 260—296 B **1 Claim**

1. The compound 2-(2,3-dihydroxypropylamino)quinolizinium bromide.

3,856,805

SILVER ZINC ALLANTOIN COMPLEX

Harry W. Margraf, St. Louis, Mo., assignor to Washington University, St. Louis, Mo.

Filed June 16, 1971, Ser. No. 153,820

Int. Cl. C07d *49/32*

U.S. Cl. 260—299 **7 Claims**

1. Silver-zinc-allantoinate of the formula $(C_4H_5O_3N_4Ag)_2{:}Zn(OH)_2$.

3,856,806

THIAZOLECARBOXAMIDE SULFONYLUREA HYPOGLYCEMIC AGENTS

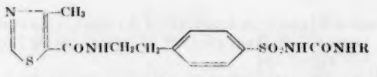
Donald E. Kuhla, Gales Ferry; Reinhard Sarges, Mystic, and Hans E. Wiedermann, Niantic, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Mar. 7, 1973, Ser. No. 338,965

Int. Cl. C07d *91/32*

U.S. Cl. 260—302 R **4 Claims**

1. A sulfonylurea compound selected from the group consisting of benzenesulfonylureas of the formula:



and the base salts thereof with pharmacologically acceptable cations, where R is bicyclo[2.2.1]hept-5-en-2-yl-endo-methyl or cycloalkyl having from five to seven carbon atoms.

3,856,807

L-(αS,5S)-α-AMINO-3-CHLORO-2-ISOXAZOLINE-5-ACETIC ACID

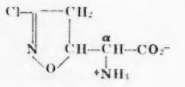
Ladislav J. Hanka, and David G. Martin, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 234,347, March 13, 1972, abandoned. This application Feb. 2, 1973, Ser. No. 329,001

Int. Cl. C07d *85/16*

U.S. Cl. 260—307 F **5 Claims**

1. A compound of the formula:



and its salts.

3,856,808

S-TRIAZOLO (4,3-D)(1,4)BENZOTHIAZEPIN-3(2H)-ONE-7,7-DIOXIDES

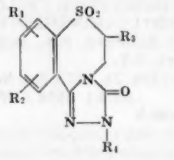
Faizulla G. Kathawala, West Orange, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

Filed Apr. 2, 1973, Ser. No. 346,721

Int. Cl. C07d *99/10*

U.S. Cl. 260—308 C **9 Claims**

1. A compound of the formula



wherein

R_1 and R_2 each independently represent hydrogen, halo having an atomic weight of 18 to 80, alkyl of 1 to 4 carbon atoms, nitro or trifluoromethyl, provided that when one of R_1 and R_2 is nitro or trifluoromethyl, the other is hydrogen, and

R_3 or alkyl of 1 to 4 carbon atoms, and

R_4 is hydrogen or alkyl of 1 to 4 carbon atoms,

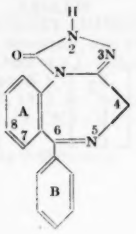
or a pharmaceutically acceptable acid addition salt thereof.

3,856,809
PROCESS FOR PREPARING 2,4-DIHYDRO-6-PHENYL-1H-S-TRIAZOLO[4,3-A][1,4]BENZODIAZEPIN-1-ONE COMPOUNDS

Jackson B. Hester, Jr., Gelesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

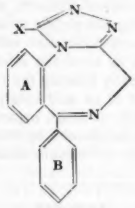
Filed Sept. 17, 1973, Ser. No. 397,966
Int. Cl. C07d *57/02*
U.S. Cl. 260—308 C **4 Claims**

1. A process for the production of a 2,4-dihydro-6-phenyl-1H-s-triazolo[4,3-a][1,4]benzodiazepin-1-one of the formula II:



II

wherein the A-ring is substituted in position 8 with hydrogen, chlorine or bromine; and wherein the B-ring is substituted in the ortho positions with hydrogen, chlorine, or fluorine, which comprises: Heating between 100°–150° a compound of formula I



I

wherein X is chlorine or bromine and rings A and B are defined as above, with an aqueous mineral acid for 1 to 10 hours, to obtain the compound of formula II above.

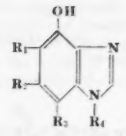
3,856,810
4-HYDROXY-7-METHYL-BENZIMIDOZOLE

Gregoire Kalopissis, Paris, and Andree Bugaut, Boulogne-sur-Seine, both of France, assignors to Societe Anonyme dite : L'Oreal, Paris, France

Continuation-in-part of Ser. No. 832,867, June 12, 1969, Pat. No. 3,658,455. This application Jan. 19, 1972, Ser. No. 219,149
Int. Cl. C07d *49/38*
U.S. Cl. 260—309.2 **2 Claims**

1. A benzimidazole derivative selected from the group consisting of

a. a compound having the formula



wherein R_1 and R_2 are selected from the group consisting of hydrogen and methyl, R_3 is methyl and R_4 represents a member selected from the group consisting of hydrogen and alkyl having 1–4 carbon atoms, and

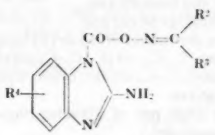
b. an acid salt of said compound.

3,856,811
2-AMINOBENZIMIDAZOLE-1-CARBOXYLIC ACID KETONE OXIME ESTERS

Werner Daum, Krefeld-Bockum; Hans Scheinpflug, and Paul-Ernst Frohberger, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 3, 1972, Ser. No. 277,829
Claims priority, application Germany, Aug. 14, 1972, 2140863
Int. Cl. C07d *49/38*
U.S. Cl. 260—309.2 **10 Claims**

1. A 2-aminobenzimidazole-1-carboxylic acid ketone oxime ester of the formula



in which

R^2 is lower alkyl or phenyl,

R^3 is lower alkyl, or

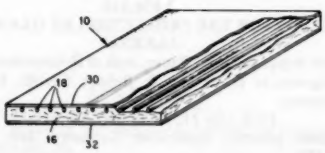
R^2 and R^3 together are alkylene of 4 to 10 carbon atoms, and

R^4 is hydrogen or alkyl of up to 8 carbon atoms.

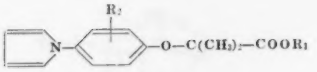
3,856,812
PYRROLE PHENOXYACETIC ACID DERIVATIVES

Johann Dahm; Joachim Borck; Herbert Nowak; Zdenek Simane, and Detlev Kayser, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit berschraenkter Haftung, Darmstadt, Germany

Division of Ser. No. 234,343, March 13, 1972, Pat. No. 3,804,839. This application Sept. 4, 1973, Ser. No. 393,934
Claims priority, application Germany, Mar. 15, 1971, 2312272
Int. Cl. C07d *27/24*
U.S. Cl. 260—326.41 **6 Claims**



1. A compound of the formula



wherein R_1 is the H or alkyl of 1–10 carbon atoms and R_2 is H, alkyl of 1–4 carbon atoms or halogen.

3,856,813

MACROCYCLIC SULFIDES

Charles J. Pedersen, Salem, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 814,179, April 7, 1969, abandoned. This application Dec. 12, 1972, Ser. No. 314,408

Int. Cl. C07d *89/20*

U.S. Cl. 260—327 B **17 Claims**

1. A macrocyclic sulfide characterized by a macrocyclic ring of carbon and hetero atoms totaling 12–30 ring atoms, from 4–10 hetero atoms being present in the ring, at least one hetero atom being sulfur and the remainder being oxygen, each hetero atom in the ring being separated from its adjoining hetero atoms in the ring by a saturated 2 to 3 carbon atom chain and the macrocyclic ring being fused by vicinal carbon atoms to 1–4 carbocyclic rings selected from the group:

a. phenylene and naphthylene,

b. saturated analogs of (a) and

c. substitution derivatives of (a) or (b) from the group halo, nitro, amino, C_1–C_4 alkyl, [C_2–C_4]alkenyl, C_6–C_{12} aryl, C_7–C_{16} aralkyl, C_1–C_4 alkoxy, cyano, hydroxy, carboxy or sulfo derivatives;

provided that a single pair of adjoining ring-sulfur atoms can be methylene-separated.

3,856,814

OLAN-2-YLIDENEMALONATES

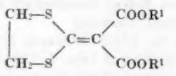
Kuniaki Taninaka, Ibargi; Osamu Shioyama, Osaka, and Kikuzo Murata, Kawachinagano, all of Japan, assignors to Nihon Nohyaku Co., Ltd., Tokyo, Japan

Division of Ser. No. 112,054, Feb. 2, 1971, Pat. No. 3,761,596. This application Feb. 27, 1973, Ser. No. 336,344

Int. Cl. C07d *71/00*

U.S. Cl. 260—327 M **5 Claims**

1. A compound of the formula



wherein R^1 is a lower alkyl of 3 or 4 carbon atoms or allyl.

3,856,815

PROCESS FOR THE PRODUCTION OF OXA-BICYCLO ALKENES

Rudolf Hopp, and Kurt Bauer, both of Holzminden, Germany, assignors to Haarmann & Reimer GmbH, Holzminden, Germany

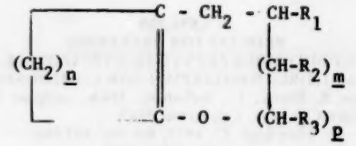
Filed July 21, 1972, Ser. No. 274,133

Claims priority, application Germany, July 21, 1971, 2136496

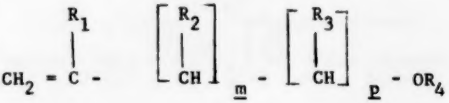
Int. Cl. C07d *9/00, 7/20*

U.S. Cl. 260—333 **14 Claims**

1. Process for the production of an oxa-bicyclo alkene compound of the formula



which process comprises reacting in 1 to 20 hours at 40° to 200°C. a cycloalkanone of from 11 to 15 ring carbon atoms with an alkene compound of the formula



wherein

R_1, R_2 and R_3 are individually hydrogen, methyl or ethyl;

m and *p* are individually 0 or 1;

R_4, when m and p are both 0, is a lower aliphatic carboxylic acid radical, or when one of *m* and *p* is 1, is hydrogen or a lower aliphatic carboxylic acid radical;

in the presence of a radical initiator, separating the excess cycloalkanone following completion of said reaction, when R_4 is a lower aliphatic carboxylic acid radical hydrolyzing the reaction mixture with an alcoholic solution of an alkali hydroxide, and subsequently treating the reaction mixture with 0.01 to 5% by weight of an acid catalyst selected from the group consisting of mineral acids, organic acids, Lewis acids or acid solid catalysts for about 5 to 30 minutes at about 90° to 150° C. to form said oxa-bicyclo alkene cmpound.

3,856,816

PHENYL CARBAMATES

Erwin Nikles, Liestal; Volker Dittrich, and Ladislaus Pinter, both of Basel, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 197,474, Nov. 10, 1971, Pat. No. 3,781,301, which is a continuation of Ser. No. 2,445, Jan. 12, 1970, abandoned, which is a continuation-in-part of Ser. No. 728,335, May 13, 1968, abandoned, which is a division of Ser. No. 493,256, Oct. 5, 1965, abandoned. This application Oct. 1, 1973, Ser. No. 402,650

Claims priority, application Switzerland, Oct. 8, 1964, 13113/64

Int. Cl. C07d *17/00*

U.S. Cl. 260—338 **1 Claim**

1. Ortho-(1,3-Dioxep-5-en-2-yl)-phenyl-N-methylcarbamate.

3,856,817

ARYL KETALS OF POLYCYCLIC OXO COMPOUNDS AND PROCESSES

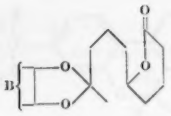
Michael Rosenberger, Bloomfield, and Gabriel Saucy, Essex Falls, both of N.J., assignors to Hoffman-La Roche, Inc., Nutley, N.J.

Division of Ser. No. 11,025, Feb. 12, 1970, , which is a continuation-in-part of Ser. Nos. 824,319, May 13, 1969, Pat. No. 3,544,600, and Ser. No. 825,389, May 16, 1969, abandoned. This application Sept. 14, 1972, Ser. No. 289,015

Int. Cl. C07d *13/10*

U.S. Cl. 260—340.5 **2 Claims**

1. A compound of the formula



wherein B is the remaining residue of a phenylene, 4,5-dimethylphenylene or ,3-naphthalene moiety.

3,856,818

TRICYCLIC PHENOXY AMINOPROPANOLS

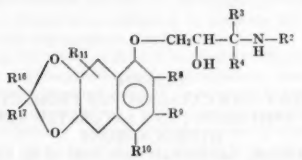
Frederic Peter Hauck, Somerville, and Christopher Michael Cimarusti, Somerset, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed July 3, 1972, Ser. No. 268,313

Int. Cl. C07d *13/10*

U.S. Cl. 260—340.5 **6 Claims**

1. A compound having the structure



or a physiologically acceptable acid-addition salt thereof, wherein R^2 is lower alkyl; R^3 and R^4 are hydrogen or methyl; R^8, R^9 and R^{10} are each hydrogen or a non-tertiary lower alkyl; R^{11} is hydrogen, lower alkyl or phenyl-lower alkyl; R^{16} and R^{17} are each hydrogen or lower alkyl; and wherein lower alkyl is alkyl having up to eight carbon atoms.

3,856,819

PROCESS FOR THE PREPARATION OF COUMARIN AND ALKYLATED DERIVATIVES THEREOF

Johannes J. M. Deumens, Limbricht; Egidius J. M. Verheijen, and Jazef A. Thoma, both of Sittard, all of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

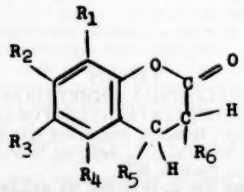
Filed June 22, 1973, Ser. No. 372,507

Claims priority, application Netherlands, June 22, 1972, 7208529

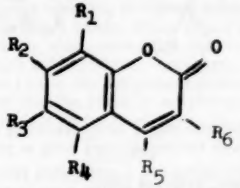
Int. Cl. C07d *7/26*

U.S. Cl. 260—343.2 R **6 Claims**

1. The process for the preparation of a compound selected from the group consisting of coumarin and lower alkyl-substituted coumarin comprising heating a compound of the formula:



wherein each of R_1, R_2, R_3, R_4, R_5 and R_6 each independently represents hydrogen or a lower alkyl, provided that the total number of carbon atoms of the $R_1 - R_6$ substituents is at most 10 at a temperature in the range of about 200° - 350°C in the liquid phase and in the presence of a metallic dehydrogenation catalyst in an amount of 0.001–1.000 percent by weight calculated as metal based on the weight of the starting material to obtain a coumarin compound from the reaction mixture of the formula:



wherein each of R_1, R_2, R_3, R_4, R_5 and R_6 each independently represents hydrogen or a lower alkyl, provided that the total number of carbon atoms of the $R_1 - R_6$ substituents is at most 10.

3,856,820

2-AMINOMETHYL DIBENZO (B,D) PYRANS

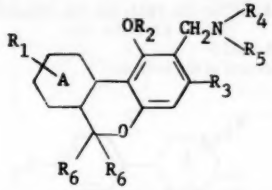
Bernard Loev, Broomall, Pa., assignor to Smith Kline Corporation, Philadelphia, Pa.

Filed July 18, 1973, Ser. No. 380,326

Int. Cl. C07d *7/20*

U.S. Cl. 260—345.3 **4 Claims**

1. A compound of the formula:



in which:

ring A is a benzene ring, a cyclohexane ring or a cyclohexene ring with the double bond being at position 6*a*–10*a*, 8 or 9;

R_1 is hydrogen, methyl or ethyl;

R_2 is hydrogen or lower alkanoyl of from two to five carbon atoms;

R_3 is a saturated hydrocarbon chain optionally branched with from one to three alkyl groups, each group consisting of one or two carbon atoms, with R_3 containing a total of from five to twelve carbon atoms;

R_4 and R_5 are hydrogen or lower alkyl of from one to four carbon atoms or are joined together with the nitrogen atom to which they are attached to form a piperidine or a pyrrolidine ring; and

R_6 is methyl or ethyl.

3,856,821

ALKOXY DIBENZO (B,D) PYRANS

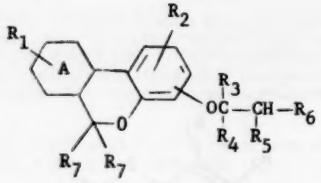
Bernard Loev, Broomall, Pa., assignor to Smith Kline Corporation, Philadelphia, Pa.

Filed July 18, 1973, Ser. No. 380,434

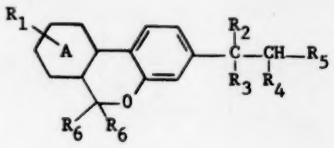
Int. Cl. C07d *7/20*

U.S. Cl. 260—345.3 **5 Claims**

1. A compound of the formula:



in which:
ring A is a benzene ring, a cyclohexane ring or a cyclohexane ring with the double bond being at position 6a-10a, 8 or 9;
R_1 is hydrogen, methyl or ethyl;
R_2 is hydrogen or OR′ where R′ is hydrogen or alkanoyl of from two to five carbon atoms;
R_3 is hydrogen, methyl or ethyl and R_4 and R_5 are hydrogen or methyl, at least one of R_3, R_4 and R_5 being other than hydrogen;
R_6 is alkyl of from four to eight carbon atoms; and
R_7 is methyl or ethyl.



in which:
ring A is a benzene ring, a cyclohexane ring or a cyclohexene ring with the double bond being at position 6a–**10a**, 8 or 9;
R_1 is hydrogen, methyl or ethyl;
R_2 is hydrogen, methyl or ethyl and R_3 and R_4 are hydrogen or methyl, at least one of R_2, R_3 and R_4 being other than hydrogen;
R_5 is alkyl of from four to eight carbon atoms; and
R_6 is methyl or ethyl.

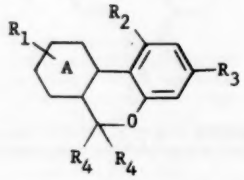
3,856,822

3-ALKENYL DIBENZO (B,D)PYRANS

Paul E. Bender, Willingboro, N.J., and Bernard Loev, Broomall, Pa., assignors to Smith Kline Corporation, Philadelphia, Pa.

Filed July 18, 1973, Ser. No. 380,435
Int. Cl. C07d *7/20*
U.S. Cl. 260—345.3 **5 Claims**

1. A compound of the formula:



in which:
ring A is a benzene ring or a cyclohexene ring with the double bond being at position 6a-10a, 8 or 9;
R_1 is hydrogen, methyl or ethyl;
R_2 is hydrogen or OR′ where R′ is hydrogen or lower alkanoyl of from two to five carbon atoms;
R_3 is an alkenyl group optionally branched with from one to three branches, each branch consisting of one or two carbon atoms, with R_3 containing one double bond and having a total of from five to twelve carbon atoms; and
R_4 is methyl or ethyl.

3,856,823

DIBENZO (B,D) PYRANS

Bernard Loev, Broomall, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed July 18, 1973, Ser. No. 380,447
Int. Cl. C07d *7/20*
U.S. Cl. 260—345.3 **5 Claims**

1. A compound formula:

3,856,824

MODIFIED P-V-FE CATALYST FOR PRODUCTION OF MALEIC ANHYDRIDE FROM SATURATED ALIPHATIC HYDROCARBONS

Harold Raffelson, and Michael Suda, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 27, 1971, Ser. No. 212,795
Int. Cl. C07d *5/00*
U.S. Cl. 260—346.8 A **10 Claims**

1. In a process for producing maleic anhydride by the catalytic oxidation of a saturated aliphatic hydrocarbon having from 4 to 10 carbon atoms wherein a stream of oxygen or oxygen-containing gas containing from about 0.5 to about 10 mole percent hydrocarbon is passed over the catalyst at a space velocity of between about 200 and 7,000 reciprocal hours at a temperature of from about 400° to about 600°C. under a pressure ranging from about 0.5 to 10 atmospheres, the improvement which comprises conducting said oxidation in the presence of a catalyst complex consisting essentially of phosphorus, vanadium, iron, oxygen, and a catalyst modifier of chromium combined with an element selected from the group consisting of nickel, boron, silver, cadmium, barium and a mixture of said elements, wherein the atomic ratio of phosphorus to vanadium is from about 1:1 to about 15:1, the atomic ratio of iron to vanadium is from about 0.2:1 to about 6:1 and the catalyst modifier is present in the range of from about 2 to about 25 atomic percent of the active metals.

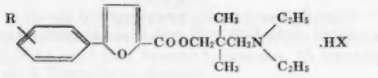
3,856,825

3-DIETHYLAMINO-2,2-DIMETHYLPROPYL 5-(SUBSTITUTED PHENYL)-2-FUROATES

George C. Wright; Homer A. Burch, and Marvin M. Goldenberg, all of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Nov. 2, 1973, Ser. No. 412,264
Int. Cl. C07d *5/26*
U.S. Cl. 260—347.5 **11 Claims**

1. A compound of the formula:



wherein R is a member of the group consisting of 4-nitro, 4-trifluoromethyl, 3,4-difluoro, 3-methoxy, 4-methyl, 4-methoxy, 4-bromo, 2,3-dichloro, 2-nitro-4-methyl, and 4-chloro, and HX is hydrochloride or fumarate.

3,856,826

PROCESS FOR OXIDIZING OLEFINS USING HYDROCARBON SOLUBLE PHOSPHORUS MODIFIED MOLYBDENUM CATALYSTS

Stanley Bruce Cavitt, Austin, Tex., assignor to Jefferson Chemical Company, Inc., Houston, Tex.

Division of Ser. No. 102,138, Dec. 28, 1970, Pat. No. 3,784,482. This application July 26, 1973, Ser. No. 382,918

Int. Cl. C07d *1/08*

U.S. Cl. 260—348.5 V **5 Claims**

1. In a liquid phase process for oxidizing olefins to olefin oxides whereby the olefin is heated with oxygen in the presence of an oxidation catalyst and an organic solvent in liquid phase at a temperature sufficient to promote the oxidation reaction, the improvement which comprises

oxidizing the olefin in the presence of an effective amount of a hydrocarbon-soluble phosphorus molybdenum-hydroxy compound catalyst prepared by heating a phosphorus compound (A) with ammonium molybdate (B) and a hydroxy compound (C) containing from 3 to 30 carbon atoms per molecule selected from the group consisting of an organic hydrocarbon primary alcohol, organic hydrocarbon secondary alcohol, a phenol and an aliphatic hydrocarbyl glycol to a temperature which dissolves said ammonium molybdate (B) wherein said phosphorus compound (A) is one capable of reacting under said conditions with said hydroxy compound (C) selected from the group consisting of phosphorus pentoxide, phosphorus trichloride, phosphorus pentasulfide, phosphorus oxychloride, phosphorus sulfochloride, phosphoric acid and phosphorous acid and wherein the hydroxy concentration of (C) is in excess of the molybdate concentration of (B) and wherein the gram-atom weight ratio of phosphorus of said phosphorus compound (A) to molybdenum of said ammonium molybdate (B) is in the range from .25:1 to 30:1.

3,856,827

SILICON CONTAINING MOLYBDENUM CATALYSTS

Stanley Bruce Cavitt, Austin, Tex., assignor to Jefferson Chemical Company, Inc., Houston, Tex.

Division of Ser. No. 102,137, Dec. 28, 1970, Pat. No. 3,787,329. This application July 26, 1973, Ser. No. 382,920

Int. Cl. C07d *1/08*

U.S. Cl. 260—348.5 V **5 Claims**

1. In a liquid phase process for oxidizing olefins to olefin oxides whereby the olefin is heated with oxygen in the presence of an oxidation catalyst and an organic solvent in liquid phase at a temperature sufficient to promote the oxidation reaction, the improvement which comprises

oxidizing the olefin in the presence of an effective amount of a hydrocarbon-soluble silicon-molybdenum-hydroxy compound catalyst prepared by reacting a silicon compound (A) at a temperature within the range of about room temperature to about 200°C for a time in the range of about 15 minutes to about 10 hours with a molybdenum-hydroxy compound (B) prepared by heating (1) ammonium molybdate and a (2) hydroxy compound containing from 3 to 30 carbon atoms per molecule selected from the group consisting of phenol, aliphatic hydrocarbyl glycol, organic hydrocarbon primary alcohol, and organic hydrocarbon secondary alcohol, wherein said heating is conducted to a temperature which dissolves said molybdate (1), wherein the hydroxy concentration of (2) is in excess of the molybdate concentration of (1), wherein the said silicon compound (A) is selected from the group consisting of a silicon halide, alkyl silicon halide, aryl silicon halide, alkoxy silicon halide, alkoxy silane, aryloxy silane, epoxyalkyl silane and an epoxy alkoxy silane and wherein the weight ratio of said silicon compound (A) to the molybdenumhydroxy compound (B) is such that the silicon to molybdenum gram atom weight ratio is in the range of 0.25 to 30.

3,856,828

ANTI-INFLAMMATORY STEROIDS OF THE ANDROSTANE SERIES HAVING A HALO-SUBSTITUTED C_1-C_2 ALKOXY CARBONYL GROUP AT THE 17β POSITION

Gordon Hanley Phillipps, Wembley; Peter John May, North Harrow; Brian McDonald, Chalfont St. Peter, and Edward Arthur Woollett, Fulmer, all of England, assignors to Glaxo Laboratories Limited, Middlesex, England

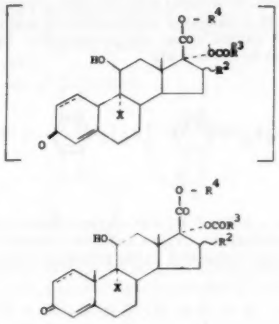
Filed July 16, 1973, Ser. No. 379,471

Claims priority, application Great Britain, July 19, 1972, 33834/72

Int. Cl. C07c *169/24*

U.S. Cl. 260—397.1 **19 Claims**

1. A compound of the formula



wherein

X represents a hydrogen, chlorine or fluorine atom;

R^2 represents a hydrogen atom, a methylene group or an α- or β-methyl group;

R^3 represents a hydrogen atom or C_{1-4} alkyl group;

R^4 represents a fluoro-, chloro- or bromomethyl group or a fluoroethyl group and represents a single or double bond.

3,856,829

16β-HYDROCARBON SUBSTITUTED ESTRANE COMPOUNDS

Kentaro Hiraga, Kyoto; Kouichi Yoshioka, Toyonaka; Giichi Goto, Suita; Ryo Nakayama, Kawanishi, and Michio Masuoka, Toyonaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

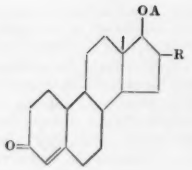
Continuation of Ser. No. 102,271, Dec. 28, 1970, abandoned. This application Mar. 5, 1973, Ser. No. 338,060

Claims priority, application Japan, Jan. 7, 1970, 45-2385

Int. Cl. C07c *169/22*

U.S. Cl. 260—397.4 **13 Claims**

1. A compound of the formula:



wherein A is hydrogen, a tetra hydropiranyl, a tetrahydrofuryl, or a tetrahydrothienyl radical or an organic carboxylic acyl radical having up to 18 carbon atoms and R is a hydrocarbon radical having 2 to 6 carbon atoms.

3,856,830

POLYMERIZABLE URETHANE COMPOUNDS

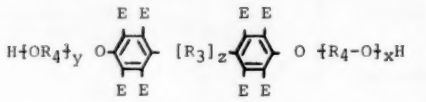
Erich Kuehn, Wilmington, Del., assignor to Atlas Chemical Industries, Inc., Wilmington, Del.

Filed Dec. 23, 1971, Ser. No. 211,670
Int. Cl. C07c *125/06*
U.S. Cl. 260—404.5 **7 Claims**

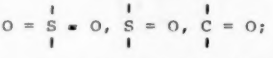
1. A polymerizable urethane compound which is the reaction product of

a. an organic polyisocyanate having at least 3 isocyanate groups, and

b. a stoichiometric quantity of a hydroxyl terminated ethylenically unsaturated ester reaction product of an ethylenically unsaturated monocarboxylic acid having from 3 to 18 carbon atoms and an etherified diphenol represented by the formula



wherein z is 0 or 1; R_3 is an alkylene radical containing 1 to 5 carbon atoms, oxygen, sulfur or a divalent radical which may be represented by the following formulas:



R_4 is ethylene or propylene; each E is individually selected from the hydrogen atoms and halogen atoms, and x and y are integers from 1 through about 20 with the proviso that the sum of x and y is from about 2 through about 30, for reacting with each of said isocyanate groups wherein the reaction between reactants (a) and (b) is carried out at a temperature within the range of 40°C. to 100°C. at atmospheric pressure in an inert atmosphere.

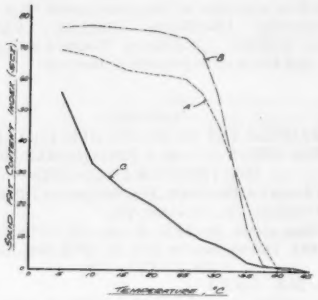
3,856,831

PROCESS FOR PREPARING HARD BUTTER

Teizabro Tateishi, Toyonaka; Koichi Murase, Izumi, and Yukio Iwanaga, Tottori, all of Japan, assignors to Fuji Oil Company Ltd., Osaka-shi, Japan

Filed July 12, 1973, Ser. No. 378,593
Int. Cl. C11c *3/12*
U.S. Cl. 260—409 **14 Claims**

1. A process for preparing a hard butter, which is suitable for use as a cocoa butter substitute in the manufacture of confectioneries without tempering, comprising hydrogenating a fat or oil having an iodine value within the range of 60 to 78 and a total linoleic acid and linolenic acid content of less than 17 weight %, based on the total weight of the oil or fat and calculated as the fatty acid; with a nickel catalyst containing



6 to 21 parts by weight sulfur per 100 parts of nickel until the absorption of hydrogen has substantially ceased.

3,856,832

PROCESS FOR RECOVERING COBALT CATALYST IN AN ACTIVE FORM FROM A HYDROESTERIFICATION REACTION MIXTURE, assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 95,958, Dec. 7, 1970, abandoned. This application May 24, 1973, Ser. No. 363,492
Int. Cl. C07c *67/00;* **C01g** *51/02*
U.S. Cl. 260—410.9 R **48 Claims**

1. A process for recovering cobalt containing catalyst in an active form from a reaction mixture containing ester product, alkanol and cobalt containing catalyst obtained from a cobalt catalyzed reaction of C_3–C_{40} olefin, carbon monoxide and alkanol which comprises mixing said reaction mixture with a normally liquid hydrocarbon in an amount sufficient to extract the ester product whereby a normally liquid hydrocarbon phase and an alkanol phase are formed, and thereafter separating said alkanol phase from said normally liquid hydrocarbon phase, said alkanol phase containing substantially all of the cobalt containing catalyst in an active form suitable for use as a catalyst for said reaction of olefin, CO and alkanol.

3,856,833

METHOD FOR THE PRODUCTION OF ALDEHYDIC ACIDS

Francesco Siclari, Barlassina, and Pietro Rossi, Paolo, Garlasco, both of Italy, assignors to Snia Viscosa Societa 'Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

Filed Feb. 17, 1972, Ser. No. 227,268
Claims priority, application Italy, Feb. 19, 1971, 20802/71
Int. Cl. C08h *17/36*
U.S. Cl. 260—413 **11 Claims**

1. A method for the production of high yields of an acidic aldehyde comprising subjecting the peroxide derivative of the ozonide of a cyclo-olefin to transposition in a polar solvent selected from the group consisting of lower alkanols and carboxylic acids by adding to the starting solution consisting of said derivative in said solvent a catalytic system which is soluble in said solvent and comprises an anhydride of an organic acid, non-reactive with carboxylic acid and a basic substance selected from the group consisting of alkali metal salts, alcoholates of an alkali metal, and organic bases.

3,856,834

GLYCERIDE OIL REFINING PROCESSES

Frank Charles Marsden, Priory Rd., St. Bees; John Maden, 10 Highfield Ct., and Paul Frederick Flanagan, 10 Standings Rise, all of Cumberland, England

Filed May 4, 1971, Ser. No. 140,231

Claims priority, application Great Britain, Aug. 28, 1970, 41619/70

Int. Cl. C11b *3/06*

U.S. Cl. 260—425 7 Claims

1. A process of refining glyceride oils which comprises mixing the oil with a dilute aqueous solution of an alkali, together with an alkali metal, alkaline earth metal or ammonium salt of a phenyl or alkylphenyl sulphonic acid containing not more than 3 alkyl substituents having not more than 4 carbon atoms in the aggregate, the concentration of sulphonate salt being from 4 to 9 percent w/w and the molar ratio of sulphonate salt to soap present being from 0.25:1 to 0.5:1; allowing the mixture formed to separate into an oily layer and an aqueous layer containing in solution the free fatty acid present in the crude oil and removing the aqueous layer.

3,856,835

REACTION PRODUCT OF AN ORGANOMETALLIC COMPOUND AND AN AMINOPOLYOL

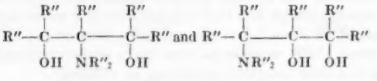
David G. Guillot, Pequannock, N.J., assignor to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 80,799, Oct. 14, 1970, Pat. No. 3,712,870. This application Nov. 8, 1972, Ser. No. 304,694

Int. Cl. C07f *3/06*

U.S. Cl. 260—429.9 16 Claims

1. A composition which comprises the reaction product of (1) 0.9 to 20 moles of an organometallic compound selected from diarylmagnesium, dialkylmagnesium, dithienylmagnesium, trialkylaluminum, dialkylzinc, and arylmagnesium chloride; and (2) one mole of an aminopolyol corresponding to one of the general formulas:



where R'' is selected from hydrogen, an alkyl group having 1 to 12 carbon atoms, an aryl group having 1 to 4 rings, or a substituted alkyl or aryl group wherein the substituents are selected from hydroxyl, halo, phenyl, halophenyl, and alkoxy and alkylthio containing 1 to 5 carbon atoms.

3,856,836

METHOD FOR MANUFACTURING A STABILIZED MANGANESE ETHYLENEBISDITHIOCARBAMATE PRODUCT AND METHOD FOR MANUFACTURING FUNGICIDAL PREPARATIONS CONTAINING SUCH STABILIZED PRODUCT

Krijn Van Den Boogaart, and Meelis Nicolaus Louis, both of Vlaardingen, Netherlands, assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed July 16, 1973, Ser. No. 379,693

Claims priority, application Netherlands, July 18, 1972, 7209913

Int. Cl. C07f *13/00*

U.S. Cl. 260—429 K 8 Claims

1. A process for preparing a stabilized manganese ethylenebisdithiocarbamate composition which comprises admixing aqueous formaldehyde solution with precipated manganese ethylenebisdithiocarbamate solids in aqueous medium obtained by reacting an aqueous solution of a water-soluble salt of ethylene bisdithiocarbamic acid with a water-soluble manganese salt, separating the formaldehyde-treated solids from the aqueous medium, washing the solids with water, and drying the solids.

3,856,837

SILICON-CONTAINING COMPLEXES

Grish Chandra, Glamorgan, Wales, assignor to Dow Corning Limited, London, England

Filed Feb. 1, 1973, Ser. No. 328,566

Int. Cl. C07f *15/00*, *15/04*

U.S. Cl. 260—429 R 4 Claims

1. A complex of the formula

$$(R'R''R'''P)_2MX_2$$

wherein R' represents the R_3SiO- group in which each R is a hydrocarbyl radical selected from the group consisting of alkyl, aryl, aralkyl, and alkaryl radicals having less than 19 carbon atoms and Q represents a divalent hydrocarbon radical having from 1 to 7 inclusive carbon atoms, R'' and R''' are each hydrocarbyl radicals selected from the group consisting of alkyl, aryl, aralkyl, and alkaryl radicals having less than 19 carbon atoms and the R_3SiQ— radical, M is an atom selected from the group consisting of Ni, Pd and Pt and each X is an anionic ligand selected from the group consisting of H, Cl, Br, I, $-NO_2$, $-NO_3$, $-SCN$, $-OCOCH_3$, hydrocarbyl alkyl, hydrocarbyl aryl, hydrocarbyl alkaryl and hydrocarbyl aralkyl radicals having less than 19 carbon atoms or the two X substituents taken together represent the $-SO_4$ radical; not more than one X being a hydrogen atom and the remaining X being Cl, Br or I when one X is hydrogen.

3,856,838

BETA-NAPHTHYL ALKYLIDENE CARBAZIC ACID ESTERS

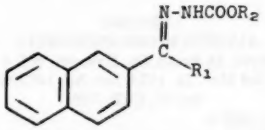
John Paul Dusza, Nanuet; Harry Lee Lindsay, Pearl River, and Seymour Bernstein, New City, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 17, 1973, Ser. No. 425,420

Int. Cl. C07c *125/06*

U.S. Cl. 260—471 C 5 Claims

1. A compound of the formula:



wherein R_1 is selected from the group consisting of hydrogen and lower alkyl (C_1-C_6), and R_2 is lower alkyl (C_1-C_6).

3,856,839

ALKANEDIOXY TITANIUM CHELATES

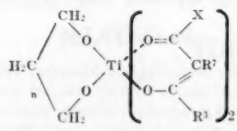
Stanley D. Smith, Ballston Lake, and Stephen B. Hamilton, Jr., Schenectady, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 104,484, Jan. 6, 1971, abandoned. This application Nov. 22, 1972, Ser. No. 308,673

Int. Cl. C07f *7/28*

U.S. Cl. 260—429.5 3 Claims

1. A titanium chelate of the formula:



wherein R^3 is a methyl radical, R^7 is selected from the group consisting of hydrogen, hydrocarbyl having not more than about 8 carbon atoms, halohydrocarbyl having not more than about 8 carbon atoms, acyl having not more than about 8

carbon atoms, and taken together with R^3 forms together with the carbon atoms to which they are attached cyclic hydrocarbon substituents of not more than about 12 carbon atoms and chloro, nitro, acyl, cyano and carboxy ester substituted cyclic hydrocarbon substituents, X is a radical selected from the class consisting of radicals having not more than about 8 carbon atoms selected from the group consisting of alkoxy, haloalkoxy, cyanoalkoxy and amide, and *n* has a value of 0 to 8.

3,856,840

ORGANOTIN HETEROCYCLIC COMPOUNDS

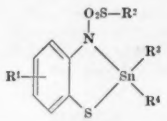
Joseph L. O'Brien, Southampton, and Richard Derby, Huntingdon Valley, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Dec. 11, 1972, Ser. No. 314,208

Int. Cl. C07f *7/22*

U.S. Cl. 260—429.7 **10 Claims**

1. Organotin heterocyclic compounds having the formula:



wherein R^1 is chosen from the group consisting of hydrogen, halogen, trifluoromethyl, alkoxy, carboalkoxy and lower alkyl or a plurality of them, R^2 is an hydrocarbyl radical containing up to 12 carbon atoms and selected from alkyl, cycloalkyl, aryl, alkaryl and aralkyl and R^3 and R^4 can be the same or different and are each monovalent hydrocarbyl radicals containing 1 to 18 carbon atoms and are selected from alkyl, alkenyl, cycloalkyl, aryl and aralkyl.

3,856,841

ALUMINUM ORGANOIODIDES

George G. Merkl, 46 Sunset Ct., Haworth, N.J. 07641

Filed Mar. 28, 1973, Ser. No. 345,659

Int. Cl. C07f *5/06*

U.S. Cl. 260—448 A **10 Claims**

1. A method of forming an aluminum organoiodide comprising the steps of forming a reactive aluminum by permeating highly pure aluminum in the presence of a hydrogen ion source with another metal having an atomic volume close to that of hydrogen, and subsequently, reacting the reactive aluminum with a combination of iodine and an organic compound selected from the group consisting of alcohol, ketone, aldehyde, phenol, gylcol, and carboxylic acids whereby said aluminum organoiodide is formed.

3,856,842

PROCESS FOR PRODUCING SILYLTHIOETHERS

Yoichiro Nagai, and Iwao Ojima, both of Sagamihara, Japan, assignors to Sagami Chemical Research Center, Japan

Filed Aug. 23, 1973, Ser. No. 391,039

Claims priority, application Japan, Nov. 27, 1972, 47-117953

Int. Cl. C07f *7/08*

U.S. Cl. 260—448.2 E **6 Claims**

1. A process for producing a silylthioether which comprises reacting an organosilicon hydride selected from the group consisting of trialkyl monohydrosilanes, triaryl monohydrosilanes, aryldialkyl monohydrosilanes, diarylalkyl monohydrosilanes, diarylalkyl monohydrosilanes, diaryl dihydrosilanes, arlyalkyl dihydrosilanes, dialkyl dihydrosilanes, aryl trihydrosilanes, and alkyl trihydrosilanes with a merpactan selected from the group consisting of alkyl mercaptans, aralkyl mercaptans and aryl mercaptans in the presence of tris (triphenylphosphine) halorohodium.

3,856,843

PROCESS FOR PRODUCING SILYLETHER

Yoichiro Nagai, and Iwao Ojima, both of Sagamihara, Japan, assignors to Sagami Chemical Research Center, Japan

Filed June 13, 1973, Ser. No. 369,596

Claims priority, application Japan, June 13, 1972, 47-58256; Aug. 2, 1972, 47-76890; Sept. 12, 1972, 47-90947

Int. Cl. C07f *7/18*

U.S. Cl. 260—448.8 R **7 Claims**

1. A process for preparing a silylether which comprises reacting a carbonyl compound selected from the group consisting of aliphatic aldehydes, aromatic aldehydes, aliphatic ketones, aromatic ketones, terpene aldehydes, and terpene ketones with an organosilicon hydride selected from the group consisting of trialkylsilanes, dialkylsilanes, monoalkylsilanes, triphenylsilanes, phenyldialkylsialnes, diphenylalkylsilanes, diaphenylsilanes, phenylalkylsilanes and phenylsilanes in the presence of a tris (triphenylphosphine) chlororhodium catalyst.

3,856,844

CHEMICAL PROCESS

Andrew O. Wikman, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 11, 1970, Ser. No. 97,373

Int. Cl. C07c *121/42*

U.S. Cl. 260—465.5 A **11 Claims**

1. In a process for producing nitrilotriacetonitrile from ammonia, formaldehyde, hydrogen cyanide, and a strong mineral acid, the improvement wherein:

A. at least one of said reactants is combined with the other reactants and at least partially reacted therewith in an aqueous system in a first reaction zone at a pH at least as acidic as about 2.0 at a temperature from about 120° to about 250°F, wherein the reaction to nitrilotriacetonitrile is less than complete, producing an effluent,

B. the effluent from said first reaction zone is reduced in temperature by at least about 10°F so that the resultant temperature thereof is within the range from about 50° to about 150°F, and

C. the cooled effluent is reacted substantially completely at a temperature from about 150° to about 250°F to produce nitrilotriacetonitrile, the heat capacity of the reduced temperature effluent being utilized to absorb at least a part of the heat liberated at this step of the reaction to hold the temperature within the range specified.

3,856,845

ETHERIFICATION OF BARK EXTRACTS AND CONDENSED TANNINS

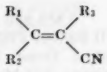
Karl David Sears, Shelton, Wash., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 21, 1972, Ser. No. 282,333

Int. Cl. C08b *5/02*; **C08h** *5/00*

U.S. Cl. 260—465.9 **5 Claims**

1. Etherified polyphenolic derivatives produced by reacting at a temperature of from 110° to 260°C in the presence of an alkaline catalyst a polyphenolic extract selected from the class consisting of bark polyphenolic extracts and condensed tannin wood extracts with an olefin of the formula



in which R_1, R_2 and R_3 are the same or different and are from the group consisting of H and 1 to 3 carbon alkyl, the mole/mole ratios of olefin reactant to monomeric unit in the polyphenolics ranging from about 1:1 to 10:1.

3,856,846

PROCESS FOR PREPARING BIS-(4-HYDROXY-3,5-DIALKYLBENZYL) CARBOXYLIC ACID ESTERS

Heinz Eggensperger, Bensheim; Volker Franzen, Heidelberg; Karl-Heinz Diehl, and Wilfred Kloss, both of Bensheim, all of Germany, assignors to Ciba-Geigy Marienberg GmbH, Postfach, Germany

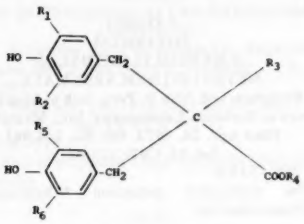
Continuation-in-part of Ser. No. 714,100, March 18, 1968, Pat. No. 3,646,110. This application Dec. 22, 1971, Ser. No. 211,125

Claims priority, application Germany, Mar. 17, 1967, 52555

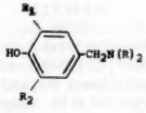
Int. Cl. C07c *69/76, 121/76*

U.S. Cl. 260—465 D **17 Claims**

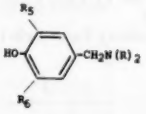
1. A process for preparing bis-(4-hydroxy-3,5-dialkylbenzyl) carboxylic acid esters having the formula



which comprises reacting at 60°to 250°C. (a) 1 mole of



and (b) one mole of



wherein R is lower alkyl; R_1, R_2, R_5 and R_6 are alkyl groups having one to six carbon atoms; R_3 is selected from the group consisting of hydrogen, —CN and —$COOR_4$ and R_4 is selected from the group consisting of alkyl, straight chain alkenyl, sulfur interrupted alkyl, oxygen interrupted alkyl and aralkyl all having up to 20 carbon atoms, with (c) one mole of a carboxylic acid ester having the formula R_3—CH_2COOR_4 in the presence of a catalytic amount of an alkaline compound selected from the group consisting of alkali metal and alkaline earth metal compounds.

3,856,847

METAL SALTS OF BIS-THIOUREIDO BENZENES

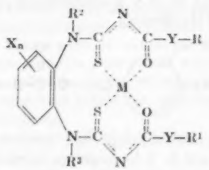
Keisuke Kohmoto, Tottori, and Koshin Miyazaki, Odawara, both of Japan, assignors to Nippon Soda Company, Limited, Tokyo, Japan

Division of Ser. No. 128,147, March 25, 1971, Pat. No. 3,769,308, which is a continuation-in-part of Ser. No. 771,269, Oct. 28, 1968,. This application May 24, 1973, Ser. No. 363,502

Int. Cl. C07c *157/06*

U.S. Cl. 260—470 **6 Claims**

1.



wherein each of R and R^1 represents a member selected from the group consisting of alkyl with 1 to 12 carbon atoms, alkyl with 1 or 2 carbon atoms substituted with halogen, methoxy or phenyl, alkenyl with 2 to 3 carbon atoms, alkynyl with 2 to 3 carbon atoms, aryl selected from the group consisting of phenyl and naphthyl and phenyl substituted with halogen, nitro or methyl; each of R^2 and R^3 represents hydrogen or methyl; each X represents halogen, nitro or methyl; *n* represents an integer from 0 to 3; each y represents oxygen and M represents calcium or barium.

3,856,848

PROCESS FOR PREPARING A PROTECTED ARGININE

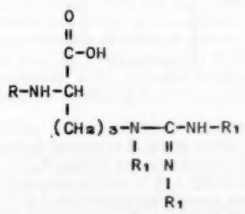
Edward L. Smithwick, Jr., Indianapolis, Ind., assignor to Eli Lilly and Compnay, Indianapolis, Ind.

Filed Dec. 26, 1973, Ser. No. 427,971

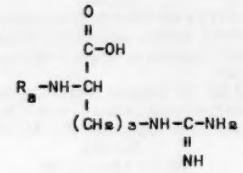
Int. Cl. C07c *129/08*

U.S. Cl. 260—482 C **8 Claims**

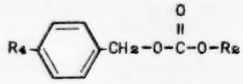
1. A process for preparing a protected arginine of the formula



in which R is benzyloxycarbonyl, benzoyl, p-methoxybenzyloxycarbonyl, p-nitrobenzyloxycarbonyl, or t-butoxycarbonyl, and one R_1 is hydrogen and the other two are benzyloxycarbonyl or p-methoxybenzyloxycarbonyl, which comprises (a) treating an arginine of the formula



in which R_a is hydrogen, benzyloxycarbonyl, benzoyl, p-methoxybenzyloxycarbonyl, p-nitrobenzyloxycarbonyl, or t-butoxycarbonyl, in an N,N-disubstituted amide solvent with a compound of the formula



in which R_2 is pentachlorophenyl, 2,4,5-trichlorophenyl, or p-nitrophenyl, and R_4 is hydrogen or methoxy, at a temperature of from about 40°C. to about 90°C. for from about 12 to about 72 hours and in the presence of a silyl-amide and (b) treating the resulting N^G-protected arginine derivative with at least about 4 molar equivalents of a lithium salt of an acid having a pK of from about 4 to about 6 in the presence of an alcohol of the formula R_5OH in which R_5 is a C_1 to C_6 alkyl to produce said protected arginine in the form of its lithium salt.

3,856,849

CARBOXYLIC ACID PERFLUOROALKYL ESTERS

Helmut Huber-Emden, Basel, and Paul Schafer, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

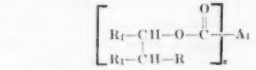
Filed Oct. 17, 1973, Ser. No. 407,397

Claims priority, application Switzerland, Oct. 18, 1972, 15243/72

Int. Cl. C07c *69/54*

U.S. Cl. 260—486 H **7 Claims**

1. Carboxylic acid perfluoroalkyl esters corresponding to the formula



wherein R_f represents a perfluorinated hydrocarbon radical with 1 to 22 carbon atoms, R represents hydrogen or methyl, R_1 represents chlorine or the radical R_1'-O-, in which R_1' represents alkyl with 1 to 12 carbon atoms, cycloalkyl with 5 or 6 ring carbon atoms, alkoxyalkyl with 2 to 10 carbon atoms, the radical $-(CH_2CH_2O)_n$-R', in which R' represents alkyl 1 to 6 carbon atoms and *n* is 1 or 2, or represents a phenyl radical or an alkylsubstituted phenyl radical with 1–4 carbon atoms in the alkyl chain, A_1 represents a hydrocarbon radical with 2 or 3 carbon atoms that is derived from monobasic, dibasic, or tribasic ethylenically unsaturated carboxylic acids, and *s* is a whole number from 1 to 3.

3,856,850

PLANT GROWTH REGULATING COMPOSITION

Hideshi Tsuchiya, Tokyo; Tetsuo Takematsu, Utsunomiya; Yoichi Hasegawa, Niigata, and Masakazu Furushima, Matsudo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

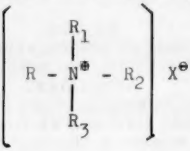
Filed Apr. 11, 1972, Ser. No. 243,058

Claims priority, application Japan, Apr. 15, 1971, 46-23431

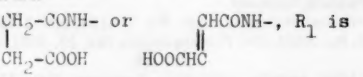
Int. Cl. C07c *103/30, 103/70;* **C07d** *27/04*

U.S. Cl. 260—501.13 **3 Claims**

1. A quaternary ammonium halide having the formula,



wherein R is



R_1 is methyl, ethyl or allyl group, R_2 and R_3 are both methyl or bonded to each other to form $-(CH_2)_4-$, and X is chlorine or bromine atom.

3,856,851

POTASSIUM N-HYDROXYLMETHYL-N-METHYLDITHIOCARBAMATE

John D. Buckman, and John D. Pera, both of Memphis, Tenn., assignors to Buckman Laboratories, Inc., Memphis, Tenn.

Filed Apr. 24, 1972, Ser. No. 246,961

Int. Cl. C07c *125/02*

U.S. Cl. 260—513.5 **1 Claim**

1. The compound potassium N-hydroxymethyl-N-methyldithiocarbamate.

3,856,852

15(S), 18-DIHYDROXY-9-OXO-5-CIS-13-TRANS-PROSTADIENOIC ACID

Charles F. Hsu, Skokie; James Jiu, and Seth Setsuo Mizuba, both of Morton Grove, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 295,209, Oct. 5, 1972, Pat. No. 3,788,947. This application Sept. 17, 1973, Ser. No. 397,899

Int. Cl. C07c *61/36*

U.S. Cl. 260—514 D **1 Claim**

1. 15(S),18-Dihydroxy-9-oxo-5-cis-13-transprostadienoic acid.

3,856,853

IODINATED 5-SUBSTITUTED-1,3-BENZENEDIACRYLIC AND DIPROPIONIC ACIDS

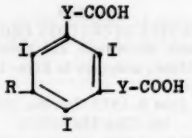
James H. Ackerman, Bethleham, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 683,455, Nov. 16, 1967, Pat. No. 3,647,864. This application Mar. 29, 1971, Ser. No. 129,140

Int. Cl. C07c *103/32*

U.S. Cl. 260—518 A **13 Claims**

1. A compound of the formula



wherein R is H_2N, (lower-alkanoyl)NH, (lower-alkanoyl)N(lower-alkyl), (carboxy-lower-alkanoyl)NH, (carboxy-lower-alkanoyl)N(lower-alkyl), (lower-alkyl)$_2$NCH=N, HO, (lower-alkanoyl)O, or (lower-alkyl)O; and Y is $-CH=C(R')-$ or $-CH_2-CH(R')-$, wherein R' is hydrogen, lower-alkyl or phenyl.

3,856,854

PROCESS OF PREPARING ALPHA-HYDROXYMETHYL AMINOACIDS

Richard A. Schnettler, 6234 W. Donges Ln., Brown Deer, Wis. 53223, and John T. Suh, 3709 W. Scenic Dr., 11 N. Mequon, Wis. 53092

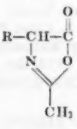
Filed Nov. 20, 1972, Ser. No. 307,947
Int. Cl. C07c *101/72*
U.S. Cl. 260—519 **3 Claims**

1. A method of preparing α-hydroxymethylated amino acids of the formula

(I)

in which R is an aminoacid residue selected from an alkyl group, phenyl, methoxyphenyl, dimethoxyphenyl, hydroxyphenyl, dihydroxyphenyl or halophenyl, which comprises reacting an aminoacid of the formula

with acetic anhydride in the presence of sodium acetate to form an azalactone of the formula



heating the resulting mixture on a steam bath and adding paraformaldehyde, then maintaining the mixture on a steam bath for about 4 to 6 hours to form the acetylated aminoacid and finally hydrolyzing that compound under acidic conditions to obtain the α-hydroxymethylated aminoacid of formula I.

3,856,855

PROCESS FOR PREPARATION OF NAPHTHALENE MONOCARBOXYLIC ACID OR NAPHTHALENE DICARBOXYLIC ACID

Gentaro Yamashita, and Kiyoshi Yamamoto, both of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Feb. 10, 1971, Ser. No. 114,386
Claims priority, application Japan, Feb. 17, 1970, 45-13569; Feb. 17, 1970, 45-13571
Int. Cl. C07c *51/20, 63/36, 63/38*
U.S. Cl. 260—524 R **5 Claims**

1. A process for the preparation of naphthalene dicarboxylic acid which consists essentially of oxidizing dimethylnaphthalene with molecular oxygen at a temperature within a range of from 100° to 160°C. under an oxygen partial pressure of from 2 to 8 atmospheres (absolute pressure) in acetic acid of an amount of at least 4 parts by weight per part by weight of dimethylnaphthalene in the presence of a catalyst consisting essentially of the following three components:

a. a cobalt compound soluble in said acetic acid under reaction conditions;
b. a manganese compound soluble in said acetic acid under reaction conditions; and
c. bromine or a bomine compound; in quantities meeting the following requirements:

$$3.0 \quad X + Y + Z \quad 8.0 \qquad (1)$$

$$1.0 \quad Z/(X + Y) \quad 2.0 \qquad (2)$$

$$0.2 \quad X / Y \quad 8 \qquad (3)$$

wherein

X represents the amount of cobalt contained in said cobalt compound in terms of parts by weight per 100 parts by weight of dimethylnaphthalene,
Y represents the amount of manganese contained in said manganese compound in terms of parts by weight per 100 parts of dimethylnaphthalene, and
Z represents the amount of the bromine contained in said bromine or bromine compound in terms of parts by weight per 100 parts by weight of dymethylnaphthalene.

3,856,856

PRODUCTION OF CARBOXYLIC ACIDS AND ESTERS

Kenzie Nozaki, St. Louis, Mo., assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 8, 1973, Ser. No. 321,896
Int. Cl. C07c *51/14, 67/00*
U.S. Cl. 260—532 **5 Claims**

1. In the process for the production of carboxylic acids by contacting an alcohol having from 1 to 10 carbon atoms with carbon monoxide at a temperature of from about 50°C to about 250°C and at a pressure of from about 500 psig to about 5,000 psig in the presence of up to about 100% by weight water based on the weight of alcohol and a catalyst consisting essentially of cobalt and iodide ion constituents, the improvement consisting essentially of adding a platinum catalyst promoter selected from the group consisting of platinum, platinum salts, haloplatinic acids, platinum oxides and platinum complexes where the stabilizing ligand is represented by the formula:

R_3E

wherein E is phosphorus or arsenic and R independently is a monovalent organic moiety of from 1 to 20 carbon atoms, is free from aliphatic carbon-carbon unsaturation, is bonded to said E atom by a carbon-E bond and is selected from unsubstituted saturated aliphatic, unsubstituted phenyl, monosubstituted saturated aliphatic and monosubstituted phenyl wherein said substituent is free from aliphatic carbon-carbon unsaturation and is selected from alkoxy, carbalkoxy, trihalomethyl, halo, dialkylamino, alkanoyloxy and phenyl, said catalyst promotor being added in an amount from about 0.1% to 10%

by weight of platinum based on the amount of cobalt in the catalyst.

3,856,857

AMINO ACIDS AND THEIR DERIVATIVES

Laszlo Beregi, Boulogne Sur Seine; Pierre Hugon, Rueil-Malmaison, and Jean-Claude Le Douarec, Suresnes, all of France, assignors to Societe en nom collectif "Science Union et Cie Societe Francaise De Recherche Medicale", Suresnes, France

Division of Ser. No. 11,330, Feb. 13, 1970, Pat. No. 3,760,009. This application June 16, 1972, Ser. No. 263,572

Int. Cl. C07c *103/50*

U.S. Cl. 260—553 E **3 Claims**

1. N-Methyl[1-(3-trifluoromethyl-4-chlorophenyl) prop-2-yl]-amino acetamide.

3,856,858

SULFONAMIDES RELATED TO N,N,N'-TETRA ALLYL DIPHENYLETHER-4,4'DISULFONAMIDE

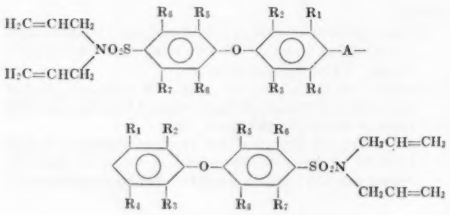
Shrikant V. Dighe, Silver Spring, and Richard W. Bush, Columbia, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Nov. 6, 1972, Ser. No. 303,848

Int. Cl. C07c *143/78*

U.S. Cl. 260—556 AR **7 Claims**

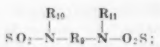
1. A compound having the formula



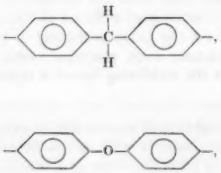
in which:

a. R_1, R_2, R_3, R_4, R_5, R_6, R_7, and R_8 are independently selected from the group consisting of hydrogen, fluorine, chloride, bromine, and lower alkyl;

b. A is



c. R_9 is



an alkylene group having 2–20 carbon atoms, a cycloalkylene group having 3–10 carbon atoms, or a phenylene group; and d. R_{10} and R_{11} are independently selected from a group consisting of hydrogen, lower alkyl, a cycloalkyl group having 3–10 carbon atoms, and a phenyl group.

3,856,859

SELECTIVE NITRATION PROCESS

George G. I. Moore, Birchwood, and Larry R. Lappi, Lake Elmo, both of Minn., assignors to Riker Laboratories, Inc., Northridge, Calif.

Filed June 8, 1973, Ser. No. 368,359

Int. Cl. C07c *143/74*

U.S. Cl. 260—556 A **11 Claims**

1. A process for the para nitration of haloalkylsulfonanilides and alkylsulfonanilides substituted by orthophenoxy, orthophenylthio, ortho-phenylsulfinyl or orthophenylsulfonyl groups comprising treating the substrate with at least an equimolar amount of a nitrating agent.

3,856,860

N-CYCLOPROPYLMETHYL HALO-ACETAMIDES

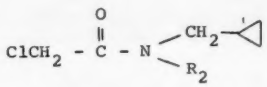
Lester L. Maravetz, Westfield, N.J., assignor to Esso Research and Engineering Company, Linden, N.J.

Division of Ser. No. 58,672, July 27, 1970, Pat. No. 3,728,386. This application Feb. 12, 1973, Ser. No. 331,722

Int. Cl. C07c *103/30*

U.S. Cl. 260—561 HL **7 Claims**

1. A compound of the formula



in which R_2 is C_1–C_4 alkyl, cyclopropyl methyl or allyl.

3,856,861

STEROIDAL INTERMEDIATES

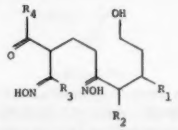
Gabriel Saucy, Essex Fells, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 259,724, June 5, 1972, Pat. No. 3,813,411, which is a division of Ser. No. 811, Jan. 5, 1970, Pat. No. 3,691,189. This application Feb. 25, 1974, Ser. No. 445,415

Int. Cl. C07c *131/00*

U.S. Cl. 260—566 A **2 Claims**

1. A compound of the formula



IV

where R_1, R_2 and R_4 are selected from the group consisting of hydrogen and lower alkyl and R_3 is selected from the group consisting of hydrogen, lower alkyl, lower alkylphenyl and phenyl lower alkyl.

3,856,862

PROCESS FOR HYDROGENATION OF DI(4-AMINOPHENYL)METHANE WITH A RHODIUM CATALYST

Tae H. Chung, Wallingford, Conn.; Michael L. Dillon, Deer Park, Tex., and Gregory L. Lines, Prospect, Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed June 25, 1973, Ser. No. 373,094

Int. Cl. C07c *85/00, 87/32*

U.S. Cl. 260—563 B **9 Claims**

1. In a process for the catalytic hydrogenation of di(4-aminophenyl)methane to di(4-aminocyclohexyl)methane at a temperature from about 25°C to about 200°C in the presence of a supported rhodium catalyst under a hydrogen pressure of from about 3 atmospheres to about 20 atmospheres in the presence of a lower alkanol containing from 1 to 8 carbon atoms inclusive, the improvement which comprises carrying out the hydrogenation under a partial pressure of ammonia,

wherein the ratio of the pressure of ammonia to the total pressure is within the range of 0.10 to 0.42 inclusive.

3,856,863

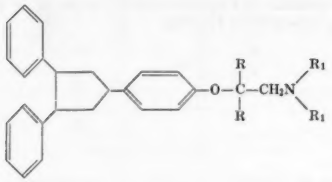
4-P-(ω-AMINOALKOXY)PHENYL-1,2-DIARYL-CYCLOPENTANES AND CYCLOPENTENES

Rudolph G. Griot, Riehen, Basel-stadt, Switzerland, assignor to Sandoz, Inc., Hanover, N.J.

Filed Apr. 9, 1969, Ser. No. 814,823
Int. Cl. C07c *93/06*
U.S. Cl. 260—570.7 **18 Claims**

1. A compound from the group of

A. compounds of the formula:



wherein each of

R is, independently, hydrogen or lower alkyl; and

each of

R_1 is, independently, lower alkyl, or both R_1 together form an alkylene bridge of four to five carbon atoms; and

B. an N-oxide of said compounds; or a pharmaceutically acceptable acid addition salt of A) and B), above.

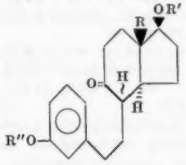
3,856,864

SYNTHESIS OF A-RING AROMATIC STEROIDS

Noal Cohen, Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 295,032, Oct. 4, 1972,. This application July 2, 1973, Ser. No. 375,558
Int. Cl. C07c *49/82*
U.S. Cl. 260—590 **9 Claims**

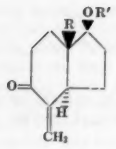
1. A process for the preparation of a compound of the formula



wherein R is lower alkyl, R′ is tertiary lower alkyl or a group of the formula

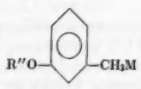
wherein R_2 is hydrogen or lower alkyl, R_3 and R_4 each taken independently is lower alkyl, and R″ is lower alkyl, tertiary lower alkyl, benzyl, diphenylmethyl or trityl,

which comprises contacting a compound of the formula



wherein R and R′ are as above,

with a compound of the formula



wherein R″ is as above and M is magnesium halide, lithium, or copper,

in an inert organic solvent and, where M is magnesium halide or lithium, in the presence of cuprous ion, and hydrolyzing the product in an aqueous medium.

3,856,865

TETRABROMO ETHER DIOL FLAME-RETARDANT

Anthony Joseph Papa, Saint Albans, W. Va.; William Robert Proops, Claymont, Del., and Theodore Curtis Shields, Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 172,301, Aug. 16, 1971, Pat. No. 3,773,696. This application July 23, 1973, Ser. No. 381,747
Int. Cl. C07c *43/12*
U.S. Cl. 260—615 R **1 Claim**

1. 2,3-dihydroxyprop-1-yl 2,3,7,8-tetrabromooct-1yl ether.

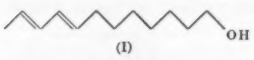
3,856,866

SYNTHESIS OF CODLING MOTH ATTACTANT

Clive A. Henrick, and John B. Siddall, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 173,662, Aug. 20, 1971, Pat. No. 3,783,135. This application Sept. 21, 1973, Ser. No. 399,567
Int. Cl. C07c *29/00*; C97c *33/02*
U.S. Cl. 260—632 B **10 Claims**

1. A process for the preparation of an alcohol of the formula:



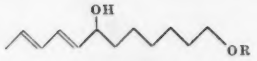
(I)

which comprises adding to trans trans sorbic acid at least two equivalents of an organolithium compound of the formula:

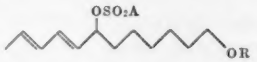
$Li(CH_2)_6OR$

wherein R is a base stable group, to form a lithium addition product, decomposing said addition product under aqueous neutral or aqueous basic conditions to yield ketone of the formula:

selectively reducing said ketone with a hydride selected from the group consisting of aluminum hydride and di-isobutyl aluminum hydride to yield an alcohol of the formula:



reacting said alcohol in an anhydrous inert solvent at 0° to −78°C with a sulfonic acid chloride to form an ester of the formula:



wherein A is methyl, toluene or a toluene derivative, maintaining the ester at below 0°C and reducing said ester with sodium amalgam, lithium aluminum hydride or sodium bis (2-methoxyethoxy) aluminum hydride to yield an ether of the formula:

and removing said base stable group by hydrolysis with dilute acid to form said alcohol (I).

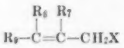
3,856,867

PROCESS FOR THE PREPARATION OF GRIGNARD REAGENTS AND THEIR UTILIZATION IN ORGANIC SYNTHESES

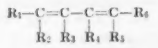
Hugh E. Ramsden, Scotch Plains, N.J., assignor to Rhodia, Inc., New York, N.Y.

Filed Mar. 6, 1972, Ser. No. 232,257
Int. Cl. C07f *3/02*
U.S. Cl. 260—665 G **12 Claims**

1. A process for preparing a Grignard reagent which comprises reacting a conjugated diene and an alkyl halide together with magnesium metal in an organic ether solvent under anhydrous conditions at a temperature within the range from about 5° to about 200°C., at a molar ratio of conjugated diene:allyl halide:magnesium within the range from about 0.5:1:1 to about 10:1:3, the allyl halide having the formula:



and the conjugated diene having the formula:



wherein R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8 and R_9 are selected from the group consisting of hydrogen and hydrocarbon groups having from one to about 50 carbon atoms, and X is selected from the group consisting of chloride, bromide and iodide.

3,856,868

SYNTHESIS OF 5-VINYLCYCLOHEXA-1,3-DIENE

Darryl R. Fahey, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 209,442, Dec. 17, 1971, abandoned. This application Jan. 11, 1974, Ser. No. 432,442
Int. Cl. C07c *3/10*
U.S. Cl. 260—666 A **10 Claims**

1. A method for producing 5-vinylcyclohexa-1,3-diene which comprises reacting under suitable reaction conditions reactants consisting essentially of butadiene and acetylene in contact with a catalyst selected from the group consisting of:
a. a reaction product obtained by the reduction of a nickel(II) compound in contact with a ligand having the formula R_3Z wherein Z is selected from the group consisting of phosphorus and arsenic, and each R is individually selected from the group consisting of alkyl radicals having from 1 to 12 carbon atoms and no branching nearer the Z than the second carbon atom, said nickel(II) compound being selected from the group consisting of nickel chloride, nickel bromide, nickel acetate, nickel iodide, nickel propionate, nickel cyanide, nickel benzoate, nickel naphthenate, nickel oxalate, nickel acetylacetonate, nickel benzoylacetonate, and combinations thereof;
b. a mixture of bis(1,5-cyclooctadiene)nickel(0) and tri-n-butyl phosphine; and
c. a reaction product obtained by the reduction of a nickel(II) complex selected from the group consisting of trans-bromo(o-tolyl)bis(triethylphosphine)nickel(II), trans-dichlorobis(triethylphosphine)nickel(II), trans-chloro(2,5-dichlorophenyl)bis(triethylphosphine)nickel(II), trans-dibromobis(triethylphosphine)nickel(II), trans-diiodobis(tri-n-butylarsine)nickel(II), and combinations thereof;
to produce 5-vinylcyclohexa-1,3-diene as a principal product of the reaction.

3,856,869

PROCESS FOR 6-ISOPROPYL-1, 1, 4-TRIMETHYLINDAN

Thomas F. Wood, Wayne, and Emanuel Heilweil, Fairfield, both of N.J., assignors to Givaudan Corporation, Clifton, N.J.

Filed June 1, 1973, Ser. No. 365,883
Int. Cl. C07c *15/20*
U.S. Cl. 260—668 F **9 Claims**

1. A process for the preparation of 6-isopropyl-1,1,4-trimethylindan which comprises contacting 7-isopropyl-1,1,4-trimethylindan or a mixture of 7-isopropyl-1,1,4-trimethylindan and 6-isopropyl-1,1,4-trimethylindan, under isomerizing conditions with an effective amount of an aluminum halide catalyst.

3,856,870

DEHYDROGENATION WITH A NONACIDIC MULTIMETALLIC CATALYST

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

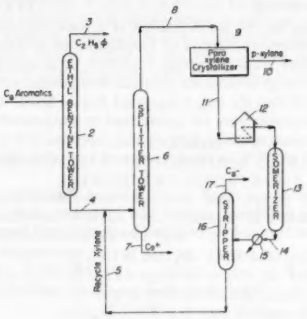
Continuation-in-part of Ser. No. 27,457, April 10, 1970, abandoned. This application June 1, 1973, Ser. No. 365,877
Int. Cl. C07c *5/18*
U.S. Cl. 260—668 D **16 Claims**

1. A method for dehydrogenating a dehydrogenatable hydrocarbon comprising contacting the hydrocarbon with a nonacidic catalytic composite comprising a pourous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to 2 wt.% iridium, about 0.01 to about 5 wt. % germanium and about 0.1 to about 5 wt.% of an alkali or alkaline earth metal, wherein the platinum or palladium, iridium, germanium and alkali or alkaline earth metal components are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum or palladium and iridium components are present in the corresponding elemental metallic state, wherein substantially all of the germanium component is present in an oxidation state above that of the elemental metal and wherein substantially all of the alkali or alkaline earth metal component is present in an oxidation state above that of the elemental metal at dehydrogenation conditions.

3,856,871
XYLENE ISOMERIZATION

Werner O. Haag, Trenton, and David H. Olson, Pennington, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 13, 1973, Ser. No. 397,038
Int. Cl. C07c 5/24
U.S. Cl. 260—668 A **2 Claims**

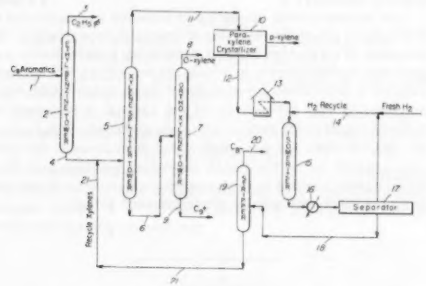


1. In a process for conversion of a mixture of aromatic compounds having **8** carbon atoms, said mixture containing ethyl benzene and xylenes, to isomerize xylenes contained in said mixture and convert at least part of ethyl benzene so contained to compounds readily separable by distillation from **8** carbon atom aromatics; the improvement which comprises containing such mixture of eight carbon atom aromatic compounds with a catalyst which comprises acid zeolite of the ZSM-5 type, acid zeolite ZSM-12 or acid zeolite ZSM-21 in liquid phase and in the absence of added hydrogen at a temperature of about 500°F. to about 660°F.

3,856,872
XYLENE ISOMERIZATION

Roger A. Morrison, Woodbury, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 13, 1973, Ser. No. 397,039
Int. Cl. C07c 5/24
U.S. Cl. 260—668 A **10 Claims**

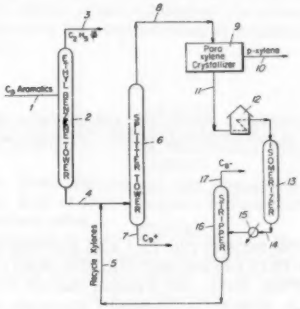


1. A new use of the known apparatus for simultaneously isomerizing xylenes and converting ethyl benzene to products readily separable by distillation from the mixture of C_8 aromatics by contacting a mixture of C_8 aromatics and hydrogen with a platinum on silica-alumina catalyst at pressure of 175 to 225 pounds per square inch, a temperature of 830 to 900°F. and liquid hourly space velocity of 0.6 to 1.6 liquid volumes of hydrocarbon per volume of catalyst per hour in a loop comprising an isomerization reactor for the contact aforesaid, distillation means for separating C_8 aromatics from lower boiling and higher boiling hydrocarbons, means to transfer hydrocarbon effluent of said isomerization reactor to said distillation means, mixing means for mixing fresh feed C_8 aromatics containing xylenes and ethyl benzene with C_8 aromatics separated by distillation means, a xylene separator for recovery of para xylene, means for transfer of mixed C_8 aromatics from said mixing means to said xylene separator, and means to transfer C_8 aromatics lean in para xylene from said xylene separator to said isomerization reactor; which new use comprises contacting, in the isomerization reactor of said known apparatus, a vapor phase mixture of hydrogen and said C_8 aromatics lean in para xylene with a zeolite catalyst of the ZSM-5 type or zeolite ZSM-12 or zeolite ZSM-21 at a temperature of 550 to 900°F., a pressure of 150 to 300 pounds per square inch and a weight hourly space velocity with respect to said zeolite alone between about 1 and about 200.

3,856,873
XYLENE ISOMERIZATION

George T. Burress, Somerville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 13, 1973, Ser. No. 397,194
Int. Cl. C07c 5/24
U.S. Cl. 260—668 A **1 Claim**



1. In a process for conversion of a mixture of aromatic compounds having eight carbon atoms, said mixture containing ethyl benzene and xylenes, to isomerize xylenes contained in said mixture and convert at least part of ethyl benzene so contained to xylene or to compounds readily separable by distillation from eight carbon atom aromatics; the improvement which comprises contacting such mixture of eight carbon atom aromatic compounds with a catalyst which comprises acid zeolite of the ZSM-5 type, acid zeolite ZSM-12 or acid zeolite ZSM-21 in vapor phase and in the absence of added hydrogen at a temperature of about 500°F. to about 1,000°F.

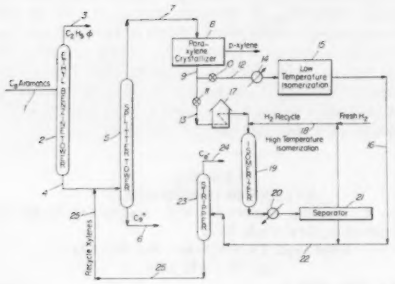
3,856,874
XYLENE ISOMERIZATION

Charles R. Hayward, East Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 13, 1973, Ser. No. 397,195
Int. Cl. C07c 5/24
U.S. Cl. 260—668 A **2 Claims**

1. In a process of selectively recovering one or more eight carbon atom aromatic isomer from a mixture of such isomers isomerizing a mixture of unrecovered isomers and recycling isomerizate to the selective recovery step; the improvement which comprises contacting a portion of said unrecovered isomers greater than half but less than 90 percent of the total with a crystalline aluminosilicate catalyst under isomerizing conditions at a temperature less than 600°F. and under pressure sufficient to maintain said unrecovered isomers in the liquid phase and contacting hydrogen and the remainder of

said unrecovered isomers in vapor phase with platinum on silica-alumina, a zeolite of the ZSM-5 type, zeolite-12 or zeolite 21 at a temperature of 550 to 900°F. and a pressure of



150 to 300 pounds per square inch; and thereafter blending the products of said contacting together for recycle as aforesaid.

3,856,875

PROCESS FOR PRODUCING 1,1,3,4,4,6-HEXAMETHYL-,2,3,4-TETRAHYDRONAPTHALENE (HMT)

Thomas F. Wood, Wayne, and Emanuel Heilweil, Fairfield, both of N.J., assignors to Givaudan Corporation, Clifton, N.J.

Filed Dec. 5, 1973, Ser. No. 422,035
Int. Cl. C07c *15/20*
U.S. Cl. 260—668 F **24 Claims**

1. A process for the preparation of 1,1,3,4,4,6-hexamethyl-1,2,3,4-tetrahydronaphthalene which comprises reacting p-cymene in equivalent or excess amounts with a substantially equimolar solution of neohexene and t-alkyl halide in the presence of an effective amount of an anhydrous aluminum halide catalyst suspended in a reaction compatible solvent.

3,856,876

DISPROPORTIONATION OF SATURATED HYDROCARBONS EMPLOYING A CATALYST THAT COMPRISES PLATINUM AND TUNGSTEN

Robert L. Burnett, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 108,377, Jan. 21, 1971,. This application Feb. 8, 1973, Ser. No. 330,534
Int. Cl. C07c *9/00, 3/00*
U.S. Cl. 260—676 R **6 Claims**

1. A process for disproportionation of saturated hydrocarbons which comprises contacting the saturated hydrocarbons in a disproportionation reaction zone at a temperature between 400°F and below 800°F and a pressure between 100 and 2,000 psig and in the presence of no more than 5 weight percent olefins in said reaction zone with a catalyst mass comprising a platinum component and a tungsten component wherein the volumetric ratio of the platinum component to the tungsten component is greater than 2:7 and less than 7:2.

3,856,877

METHOD FOR ISOMERIZATION OF LOWER POLYMERS OF BUTADIENE

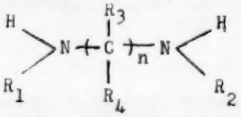
Yutaka Otsuki; Hirosuke Imai, both of Yokohama; Atsushi Kaiya, Kawasaki, and Hideo Horii, Yokohama, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Nov. 12, 1973, Ser. No. 414,624
Claims priority, application Japan, Nov. 15, 1972, 47-11444
Int. Cl. C07c *5/24*
U.S. Cl. 260—677 R **13 Claims**

1. A method for the isomerization of a lower polymer of butadiene or lower copolymer of butadiene and at least one member selected from the group consisting of a conjugated diolefin and a vinyl-substituted aromatic compound, which is characterized in that the non-conjugated double bonds in said polymers and copolymers are isomerized to conjugated double bonds by treating said polymers and copolymers at a temperature of 0° to 200°C in the presence of a catalyst comprising:

a dispersion of an alkali metal selected from the group consisting of lithium, sodium and potassium, and

a diamine compound represented by the general formula:



wherein n is an integer of 2 or 3, each of R_1, R_2 R_3 and R_4 is a hydrogen atom or an organic residual group having 1 to 20 carbon atoms, and R_1 and R_2 can be bonded together to form a cyclic structure.

3,856,878

PROCESS FOR THE ALKYLATION OF AROMATIC HYDROCARBONS

Giuseppe Messina, Alghero; Loreno Lorenzoni, Porto Torres, and Natale Bertolini, Milan, all of Italy, assignors to Societa 'Italiana Resine S.I.R.S.p.A., Milan, Italy

Filed Nov. 15, 1973, Ser. No. 416,138
Claims priority, application Italy, Nov. 30, 1972, 32270/72
Int. Cl. C07c *3/56*
U.S. Cl. 260—671 C **3 Claims**

1. A process for the alkylation of aromatic hydrocarbons by reaction of an olefin with an aromatic hydrocarbon in the presence of a complex catalyst comprising a metal halide and aromatic hydrocarbons, in which the activity of the complex catalyst is maintained by addition of fresh metal halide, characterized in that the activity of the catalyst is measured by determination of the ratio of the meta dialkylated products to the sum of ortho and para dialkylated derivatives in the complex catalyst or in the liquid alkylation product and fresh metal halide is added to the complex catalyst in such amounts as to maintain said ratio at predetermined values.

3,856,879

OXIDATIVE DEHYDROGENATION

Brent J. Bertus, and Darrell W. Walker, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 6, 1972, Ser. No. 303,766
Int. Cl. C07c *5/18*
U.S. Cl. 260—680 E **10 Claims**

1. A process for dehydrogenating at least one hydrocarbon containing at least one

grouping and having from 2 to 12 carbon atoms per molecule, said hydrocarbon being selected from the group consisting of cycloparaffins, acyclic paraffins, cyclic monoolefins, and acyclic monoolefins, which comprises contacting reatants consisting essentially of said at least one hydrocarbon and oxygen, under oxidative dehydrogenation conditions in the presence of a catalyst consisting of nickel sulfate and from 0 to 30 mol percent excess nickel in the form of free nickel or nickel oxide, to dehydrogenate said at least one hydrocarbon.

3,856,880

OXIDATIVE DEHYDROGENATION CATALYZED WITH PROMOTED ZINC FERRITE

Marvin Z. Woskow, Houston, and Harold F. Christmann, Seabrook, both of Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 15,904, March 2, 1970, Pat. No. 3,751,512. This application July 23, 1973, Ser. No. 381,813The portion of the term of this patent subsequent to Aug. 7, 1990, has been disclaimed.

Int. Cl. C07c *5/18*

U.S. Cl. 260—680 E **6 Claims**

1. In a process for the oxidative dehydrogenation of hydrocarbon compounds having 4 to 12 carbon atoms, at least one

grouping and having a boiling point below about 350°C, in the presence of oxygen and a metal ferrite catalyst consisting essentially of zinc ferrite the improvement consisting essentially of conducting said oxidative dehydrogenation process in the presence of said catalyst which contains a promoting amount in the range of 0.005 to 2 weight percent of a metal selected from the group consisting of rhenium, platinum, palladium, rhodium, ruthenium, osmium, and iridium, provided that ruthenium and rhodium are present in an amount of less than 0.1 percent.

3,856,881

METAL VANADITE CATALYZED OXIDATIVE DEHYDROGENATION PROCESS

Harold E. Manning, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 59,751, July 30, 1970, abandoned. This application Sept. 10, 1973, Ser. No. 396,033

Int. Cl. C07c *5/18*

U.S. Cl. 260—680 E **19 Claims**

1. A process for the dehydrogenation of hydrocarbon compounds having 4 to 5 non-quaternary contiguous carbon atoms and having at least one

grouping or ethyl benzene to produce corresponding dehydrogenated compounds having the same number of carbon atoms as said compounds, said process comprising contacting in vapor phase at a temperature of greater than 250°C. a mixture of said compound or compounds to be dehydrogenated and from 0.2 to 2.5 moles of oxygen per mole of said compound or compounds to be dehydrogenated with a catalyst composition comprising crystalline spinel of the general formula M_2VO_4, MV_2O_4, between MV_2O_4 and M_2VO_4 or mixtures thereof wherein M is Mn.

3,856,882

PROCESS FOR PRODUCING 2,5-DIMETHYL 2,4-HEXADIENE

Kazumi Takagi; Masahiro Murakami, and Kuniyoshi Manabe, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sept. 5, 1972, Ser. No. 286,300

Claims priority, application Japan, Sept. 6, 1971, 46-69114; Dec. 29, 1971, 46-3184

Int. Cl. C07c *11/12*

U.S. Cl. 260—681 **10 Claims**

1. A process for producing 2,5-dimethyl-2,4-hexadiene which comprises reacting at least one member selected from the group consisting of isobutylene and tertiary butanol with isobutyl aldehyde under pressure in a liquid phase at a temperature of 130–180°C in the presence of at least one catalyst selected from the group consisting of mineral acids, sulfonic acids, heteropoly acids and chlorides, sulfates and phosphates of metals and ammonia, at a molar ratio of isobutylene, tertiary butanol or mixture thereof to isobutyl aldehyde of 1–10, cooling the reaction product, separating the oil layer which has formed and successively distilling the oil layer to obtain 2,2,5,5-tetramethyl tetrahydrofuran and 2,5-dimethyl-2,4-hexadiene as separate fractions of the distillation, and incorporating the fraction of 2,2,5,5-tetramethyl tetrahydrofuran into the mixture of isobutyl aldehyde and at least one member selected from the group consisting of isobutylene and tertiary butanol.

3,856,883

GRADED RUBBER PARTICLES HAVING HYDROXY FUNCTIONALITY AND A POLYMERIC CROSSLINKING AGENT

Ray A. Dickie, Birmingham, and Seymour Newman, Southfield, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 365,379, May 29, 1973, , which is a division of Ser. No. 100,465, Dec. 21, 1970, abandoned. This application Mar. 15, 1974, Ser. No. 451,626

Int. Cl. C08g *45/04*, *15/00*

U.S. Cl. 260—836 **16 Claims**

1. In a method for forming a thermoset material wherein a crosslinkable resin and a crosslinking amount of a crosslinking agent reactive therewith are intimately mixed and reacted with each other, the improvement wherein:

A. said crosslinking agent is a graded-rubber particle consisting essentially of

1. about 10 to about 90 weight percent of a core of crosslinked acrylic polymer consisting essentially of

a. a minor and crosslinking amount of a di- or trifunctional monomer containing 2 or more nonconjugated terminal ethylenic groups, said minor and crosslinking amount not exceeding about 20 mole percent of the core reactants, and

b. a remainder consisting essentially of a monofunctional monoacrylate, said remainder constituting at a minimum about 80 mole percent of the core reactants,

2. about 90 to about 10 weight percent of an outer shell having glass transition temperature above that of said core and consisting essentially of the polymerization product of a mixture of about 30 to about 98 mole percent methyl methacrylate, 0 to about 68 mole percent of unsaturated monomers selected from monofunctional monoacrylates, diacrylates, monovinyl hydrocarbons, and about 2 to about 35 mole percent of a monomer having an olefinic group reactable with said methyl methacrylate and a hydroxyfunctional group which

a. remains unreacted in said polymerization and

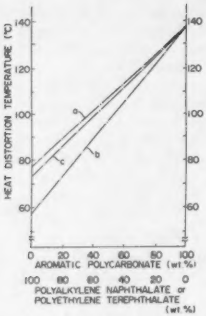
b. provides said shell with hydroxy surface-functionality that is reactive with said crosslinkable resin, and

B. said crosslinkable resin is selected from melamine-formaldehyde resins, copolymers of unsaturated monomers having repeating functional groups selected from carboxy functionality, epoxy functionality, and hydroxy functionality, and a polyepoxide having at least two epoxide groups per molecule.

3,856,884
AN AROMATIC POLYCARBONATE/POLYALKYLENE NAPHTHALATE RESIN COMPOSITION HAVING A MARBLE-LIKE APPEARANCE

Kouichi Sakai; Yoshiaki Tokai, and Sadayoshi Matsunaka, all of Sagamihara, Japan, assignors to Teijin Limited, Osaka, Japan

Filed July 31, 1973, Ser. No. 384,263
Int. Cl. C08g *39/10*
U.S. Cl. 260—860 **8 Claims**



1. A resin composition having a marble-like appearance, consisting essentially of the substantially unreacted mixture of from 5 to 90 % by weight, based on the weight of the composition, of an aromatic polycarbonate, and at least one polyalkylene naphthalate selected from the group consisting of polytetramethylene-2,6-naphthalate and polyhexamethylene-2,6-naphthalate.

3,856,885
PROCESS FOR MOLDING THERMOSETTING RESINOUS COMPOSITIONS

Akio Furuya, Yokohama, and Yukihiko Ishimaru, Ohtsu, both of Japan, assignors to Dai Nippon Toryo Co., Ltd. and Leben Utility Co., Ltd., both of Osaka-shi, Japan

Filed Oct. 26, 1972, Ser. No. 300,998
Claims priority, application Japan, Oct. 28, 1971, 46-85758; Oct. 28, 1971, 46-85757
Int. Cl. C08f *21/00*
U.S. Cl. 260—862 **10 Claims**

1. A process for the preparation of a molded article from a thermosetting resin of the unsaturated alkyd type, which comprises heating at a temperature ranging from 80° to 160°C, a liquid composition obtained by sufficiently agitating and blending a mixture comprising (A) 5 to 70% by weight of an unsaturated alkyd resin having an average degree of condensation of at least 4 and a number average molecular weight of at least 1,000 and which is a condensation product of an unsaturated polycarboxylic acid with a polyhydric alcohol, (B) 20 to 70% by weight of a vinyl monomer selected from the group consisting of styrene, chlorostyrene, tert-butyl styrene, vinyl toluene, divinyl benzene, vinyl acetate and mono esters of acrylic acid or methacrylic acid, (C) 10 to 65% by weight of a vinyl chloride resin which is a homopolymer of vinyl chloride or a copolymer of vinyl chloride with a minor amount of a copolymerizable vinyl monomer and (D) 0.2 to 3% by weight of a polymerization initiator, to such an extent that the composition is not completely cured, cooling the composition to obtain a partially-cured non-tacky solid composition of a moldable form, and heating the partially-cured composition at a temperature ranging from 120° to 180°C to complete the curing.

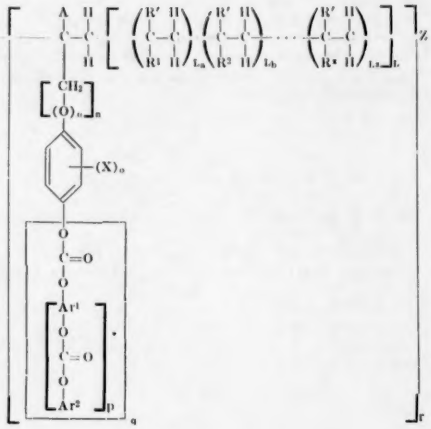
3,856,886
BLENDS OF POLYCARBONATE GRAFTS ON VINYL POLYMERS WITH POLYCARBONATES AND/OR VINYL POLYMERS

Dieter Margotte, Krefeld; Hugo Vernaleken, Krefeld-Bockum, and Hermann Schnell, Krefeld-Uerdingen, all of Germany, assignors to Bayer Aktiengesellschaft,, Leverkusen, Germany

Filed Mar. 30, 1972, Ser. No. 239,717
Claims priority, application Germany, Apr. 24, 1970, 2019992; Apr. 24, 1970, 2019994; Apr. 24, 1970, 2019993
Int. Cl. C08g *39/10*
U.S. Cl. 260—873 **19 Claims**

1. Blends comprising:

A. 5–95% by weight of a thermoplastic graft copolymer of i. 5–50% by weight, based on the weight of the graft copolymer, of a polymer backbone having from 0.1–1.5% by weight of aromatic hydroxyl groups, said polymer backbone being the reaction product of (a) an unsaturated monomer having aromatic hydroxyl groups and (b) an unsaturated monomer copolymerizable with (a), and ii. 95–50% by weight of an aromatic polycarbonate grafted onto the polymer backbone by way of the said aromatic hydroxy groups; said graft copolymer having a number average molecular weight of between 10,000 and 200,000 and corresponding to the formula:



in which R^1, and R^2, . . . R^x, which may be the same or different, are each a hydrogen or halogen atom or an alkyl radical having up to 6 carbon atoms or an aryl radical, or a monohydric alcohol ester radical, or an amide, nitrile, carboxylic acid ester or alkyl ether radical;

R′ is a hydrogen atom or a methyl radical;
A is a hydrogen atom or a methyl radical;
X is a halogen atom or a methyl radical;
Ar^1 is a bivalent aromatic radical derived from a dihydric phenol and which may be substituted in the phenyl radical by chlorine, bromine or a methyl group;
Ar^2 is phenyl, halophenyl or alkylphenyl, or is the radical Ar^1 with one hydroxy group;
L is a number from 1 to 200;
L_a, L_b . . . L_z are identical or different integers; the product $(L_a + L_b + \ldots + L_z) \cdot L$ is a number from 9 to 200;
m is zero or 1;
n is zero or 1;
o is zero, 1 or 2;
p is an integer from 5 to 100;
q is 1 or 2; and
r is an integer from 1 to 10; and
Z is

H-, C_6H_5COO- or C_6H_5-; and

B. 95–5% by weight of a thermoplastic-polymer of vinyl monomers selected from the group consisting of: ethylene, propylene, butadiene, vinyl acetate, vinyl benzoate, vinyl isobutylether, acrylamide, methacrylamide, N-methoxy-methyl-metacrylamide, acrylonitrile, methacrlonitrile, acrylic acid esters, methacrylic acid esters, styrene, vinyl toluene, 2,4-dimethyl-styrene, chlorostyrene and α-methyl-styrene.

3,856,887

FLAME RETARDANT POLYMER COMPOSITION

John B. Luce, Mount Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 215,155, Jan. 3, 1972, Pat. No. 3,796,772. This application Oct. 15, 1973, Ser. No. 406,601

Int. Cl. C08d *7/10;* **C08f** *45/56*

U.S. Cl. 260—880 R **2 Claims**

1. A flame retardant polymer composition comprising in admixture a styrene polymer selected from the group consisting of a styrene homopolymer and a copolymer of styrene of at least 50 weight percent styrene, 5–30 weight percent of a halogen containing flame retardant additive and 0.01 to about 20.0 weight percent of nickel titanate; said halogen being selected from the group consisting of bromine and chlorine.

3,856,888

FLAME RETARDANT COMPOSITIONS

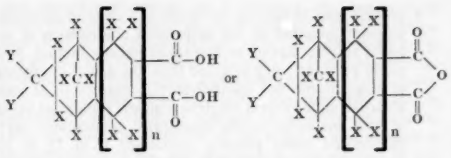
Louis Schmerling, Riverside, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 302,988, Nov. 1, 1972,. This application Apr. 26, 1974, Ser. No. 464,709

Int. Cl. C08d *7/10;* **C08f** *45/58;* **C08g** *51/58*

U.S. Cl. 260—881 **8 Claims**

1. A flame retardant composition of matter comprising a polymeric material and a polyhalo-substituted polyhydropolycyclicdicarboxylic acid or anhydride thereof having the formula:



in which Y is chlorine or bromine, X is hydrogen or halogen, at least two X's being halogen, and *n* is 0 or 1.

3,856,889

BLENDS CONTAINING POLYETHYLENE AND AN UNSATURATED POLYCARBOXYLIC ACID MODIFIED POLYOLEFIN

Richard L. McConnell, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 11, 1972, Ser. No. 288,205

Int. Cl. C08f *29/12*

U.S. Cl. 260—897 B **7 Claims**

1. A blend containing polyethylene, useful as an adhesive and coating composition, comprising a blend of (1) polyethylene having a melt viscosity of from 100 to 100,000 cp. at 190°C. and a density of from about 0.90 to about 0.94 and (2) about 0.5 to 25 percent by weight of modified polyolefin prepared from monoolefins having at least 3 carbon atoms, prepared by reacting a thermally degraded polyolefin with an unsaturated polycarboxylic acid, said modified polyolefin having a saponification number of 6–60, and a melt viscosity of 100 to 150,000 cp. at 190°C.

3,856,890

FLAME RETARDANT COMPOSITIONS

William G. Biddell, San Mateo, Calif., assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed May 23, 1973, Ser. No. 363,216

Int. Cl. C08f *45/58*

U.S. Cl. 260—897 B **5 Claims**

1. A cross-linkable, flame retardant polymeric composition comprising the following ingredients:

		Weight, %
(a)	polymer blend of approximately equal amounts of low density polyethylene plus ethylene-vinyl acetate copolymer	50 to 75
(b)	antimony trioxide	20 to 35
(c)	1,2,3,4,6,7,8,9,10,10,11,11-dodecachloro-1,4,4a,5a,6,9,9a,9b-octahydro-1,4,6,9-dimethanodibenzofuran;	10 to 30.

and wherein the weight ratio of the dimethanodibenzofuran compound to the antimony oxide is less than about 1 to 1.

3,856,891

INHERENTLY FLEXIBLE, HIGH STRENGTH SHEETING FROM BLENDS OF A SUSPENSION CHLORINATED OLEFIN POLYMER AND POST-CHLORINATED POLYVINYL CHLORIDE

Charles W. West, Cookeville, Tenn.; Glen H. Graham, Ashland, Ohio, and James S. Kennedy, Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 235,006, March 15, 1972, abandoned, which is a continuation-in-part of Ser. No. 51,680, July 1, 1970, abandoned. This application Oct. 9, 1973, Ser. No. 404,844

Int. Cl. C08f *29/24*

U.S. Cl. 260—897 C **6 Claims**

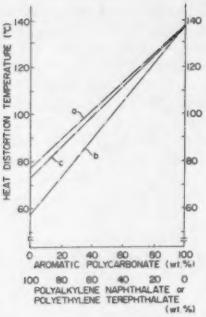
1. Inherently flexible, high strength sheeting material consisting essentially of a blend of

B. said crosslinkable resin is selected from melamine-formaldehyde resins, copolymers of unsaturated monomers having repeating functional groups selected from carboxy functionality, epoxy functionality, and hydroxy functionality, and a polyepoxide having at least two epoxide groups per molecule.

3,856,884
AN AROMATIC POLYCARBONATE/POLYALKYLENE NAPHTHALATE RESIN COMPOSITION HAVING A MARBLE-LIKE APPEARANCE

Kouichi Sakai; Yoshiaki Tokai, and Sadayoshi Matsunaka, all of Sagamihara, Japan, assignors to Teijin Limited, Osaka, Japan

Filed July 31, 1973, Ser. No. 384,263
Int. Cl. C08g *39/10*
U.S. Cl. 260—860 **8 Claims**



1. A resin composition having a marble-like appearance, consisting essentially of the substantially unreacted mixture of from 5 to 90 % by weight, based on the weight of the composition, of an aromatic polycarbonate, and at least one polyalkylene naphthalate selected from the group consisting of polytetramethylene-2,6-naphthalate and polyhexamethylene-2,6-naphthalate.

3,856,885
PROCESS FOR MOLDING THERMOSETTING RESINOUS COMPOSITIONS

Akio Furuya, Yokohama, and Yukihiko Ishimaru, Ohtsu, both of Japan, assignors to Dai Nippon Toryo Co., Ltd. and Leben Utility Co., Ltd., both of Osaka-shi, Japan

Filed Oct. 26, 1972, Ser. No. 300,998
Claims priority, application Japan, Oct. 28, 1971, 46-85758; Oct. 28, 1971, 46-85757
Int. Cl. C08f *21/00*
U.S. Cl. 260—862 **10 Claims**

1. A process for the preparation of a molded article from a thermosetting resin of the unsaturated alkyd type, which comprises heating at a temperature ranging from 80° to 160°C, a liquid composition obtained by sufficiently agitating and blending a mixture comprising (A) 5 to 70% by weight of an unsaturated alkyd resin having an average degree of condensation of at least 4 and a number average molecular weight of at least 1,000 and which is a condensation product of an unsaturated polycarboxylic acid with a polyhydric alcohol, (B) 20 to 70% by weight of a vinyl monomer selected from the group consisting of styrene, chlorostyrene, tert-butyl styrene, vinyl toluene, divinyl benzene, vinyl acetate and mono esters of acrylic acid or methacrylic acid, (C) 10 to 65% by weight of a vinyl chloride resin which is a homopolymer of vinyl chloride or a copolymer of vinyl chloride with a minor amount of a copolymerizable vinyl monomer and (D) 0.2 to 3% by weight of a polymerization initiator, to such an extent that the composition is not completely cured, cooling the composition to obtain a partially-cured non-tacky solid composition of a moldable form, and heating the partially-cured composition at a temperature ranging from 120° to 180°C to complete the curing.

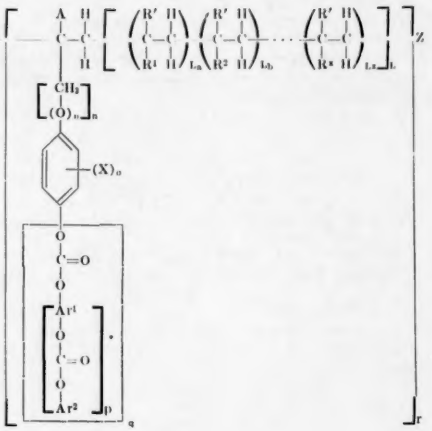
3,856,886
BLENDS OF POLYCARBONATE GRAFTS ON VINYL POLYMERS WITH POLYCARBONATES AND/OR VINYL POLYMERS

Dieter Margotte, Krefeld; Hugo Vernaleken, Krefeld-Bockum, and Hermann Schnell, Krefeld-Uerdingen, all of Germany, assignors to Bayer Aktiengesellschaft,, Leverkusen, Germany

Filed Mar. 30, 1972, Ser. No. 239,717
Claims priority, application Germany, Apr. 24, 1970, 2019992; Apr. 24, 1970, 2019994; Apr. 24, 1970, 2019993
Int. Cl. C08g *39/10*
U.S. Cl. 260—873 **19 Claims**

1. Blends comprising:

A. 5–95% by weight of a thermoplastic graft copolymer of i. 5–50% by weight, based on the weight of the graft copolymer, of a polymer backbone having from 0.1–1.5% by weight of aromatic hydroxyl groups, said polymer backbone being the reaction product of (a) an unsaturated monomer having aromatic hydroxyl groups and (b) an unsaturated monomer copolymerizable with (a), and ii. 95–50% by weight of an aromatic polycarbonate grafted onto the polymer backbone by way of the said aromatic hydroxy groups; said graft copolymer having a number average molecular weight of between 10,000 and 200,000 and corresponding to the formula:



in which R^1, and R^2, . . . R^x, which may be the same or different, are each a hydrogen or halogen atom or an alkyl radical having up to 6 carbon atoms or an aryl radical, or a monohydric alcohol ester radical, or an amide, nitrile, carboxylic acid ester or alkyl ether radical;

R' is a hydrogen atom or a methyl radical;
A is a hydrogen atom or a methyl radical;
X is a halogen atom or a methyl radical;
Ar^1 is a bivalent aromatic radical derived from a dihydric phenol and which may be substituted in the phenyl radical by chlorine, bromine or a methyl group;
Ar^2 is phenyl, halophenyl or alkylphenyl, or is the radical Ar^1 with one hydroxy group;
L is a number from 1 to 200;
L_a, L_b . . . L_z are identical or different integers; the product $(L_a + L_b + \ldots + L_z) \cdot L$ is a number from 9 to 200;
m is zero or 1;
n is zero or 1;
o is zero, 1 or 2;
p is an integer from 5 to 100;
q is 1 or 2; and
r is an integer from 1 to 10; and
Z is

H-, C_6H_5COO- or C_6H_5-; and

B. 95–5% by weight of a thermoplastic-polymer of vinyl monomers selected from the group consisting of: ethylene, propylene, butadiene, vinyl acetate, vinyl benzoate, vinyl isobutylether, acrylamide, methacrylamide, N-methoxy-methyl-metacrylamide, acrylonitrile, methacrlonitrile, acrylic acid esters, methacrylic acid esters, styrene, vinyl toluene, 2,4-dimethyl-styrene, chloro-styrene and α-methyl-styrene.

3,856,887

FLAME RETARDANT POLYMER COMPOSITION

John B. Luce, Mount Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 215,155, Jan. 3, 1972, Pat. No. 3,796,772. This application Oct. 15, 1973, Ser. No. 406,601

Int. Cl. C08d *7/10;* **C08f** *45/56*

U.S. Cl. 260—880 R **2 Claims**

1. A flame retardant polymer composition comprising in admixture a styrene polymer selected from the group consisting of a styrene homopolymer and a copolymer of styrene of at least 50 weight percent styrene, 5–30 weight percent of a halogen containing flame retardant additive and 0.01 to about 20.0 weight percent of nickel titanate; said halogen being selected from the group consisting of bromine and chlorine.

3,856,888

FLAME RETARDANT COMPOSITIONS

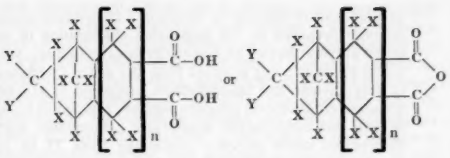
Louis Schmerling, Riverside, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 302,988, Nov. 1, 1972,. This application Apr. 26, 1974, Ser. No. 464,709

Int. Cl. C08d *7/10;* **C08f** *45/58;* **C08g** *51/58*

U.S. Cl. 260—881 **8 Claims**

1. A flame retardant composition of matter comprising a polymeric material and a polyhalo-substituted polyhydropolycyclicdicarboxylic acid or anhydride thereof having the formula:



in which Y is chlorine or bromine, X is hydrogen or halogen, at least two X's being halogen, and *n* is 0 or 1.

3,856,889

BLENDS CONTAINING POLYETHYLENE AND AN UNSATURATED POLYCARBOXYLIC ACID MODIFIED POLYOLEFIN

Richard L. McConnell, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 11, 1972, Ser. No. 288,205

Int. Cl. C08f *29/12*

U.S. Cl. 260—897 B **7 Claims**

1. A blend containing polyethylene, useful as an adhesive and coating composition, comprising a blend of (1) polyethylene having a melt viscosity of from 100 to 100,000 cp. at 190°C. and a density of from about 0.90 to about 0.94 and (2) about 0.5 to 25 percent by weight of modified polyolefin prepared from monoolefins having at least 3 carbon atoms, prepared by reacting a thermally degraded polyolefin with an unsaturated polycarboxylic acid, said modified polyolefin having a saponification number of 6–60, and a melt viscosity of 100 to 150,000 cp. at 190°C.

3,856,890

FLAME RETARDANT COMPOSITIONS

William G. Biddell, San Mateo, Calif., assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed May 23, 1973, Ser. No. 363,216

Int. Cl. C08f *45/58*

U.S. Cl. 260—897 B **5 Claims**

1. A cross-linkable, flame retardant polymeric composition comprising the following ingredients:

		Weight, %
(a)	polymer blend of approximately equal amounts of low density polyethylene plus ethylene-vinyl acetate copolymer	50 to 75
(b)	antimony trioxide	20 to 35
(c)	1,2,3,4,6,7,8,9,10,10,11,11-dodeca-chloro-1,4,4a,5a,6,9,9a,9b-octahydro-1,4,6,9-dimethanodibenzofuran;	10 to 30.

and wherein the weight ratio of the dimethanodibenzofuran compound to the antimony oxide is less than about 1 to 1.

3,856,891

INHERENTLY FLEXIBLE, HIGH STRENGTH SHEETING FROM BLENDS OF A SUSPENSION CHLORINATED OLEFIN POLYMER AND POST-CHLORINATED POLYVINYL CHLORIDE

Charles W. West, Cookeville, Tenn.; Glen H. Graham, Ashland, Ohio, and James S. Kennedy, Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 235,006, March 15, 1972, abandoned, which is a continuation-in-part of Ser. No. 51,680, July 1, 1970, abandoned. This application Oct. 9, 1973, Ser. No. 404,844

Int. Cl. C08f *29/24*

U.S. Cl. 260—897 C **6 Claims**

1. Inherently flexible, high strength sheeting material consisting essentially of a blend of

1. greater than 70 percent by weight of a chlorinated olefin polymer prepared by the suspension chlorination of an olefin polymer having an essentially linear structure, said olefin polymer being selected from the group consisting of polyethylene and interpolymers composed of at least about 90 mole percent ethylene with any remainder being at least one ethylenically unsaturated comonomer; such chlorinated olefin polymer containing from 25 to 50 weight percent of chemically combined chlorine wherein said chlorinated olefin polymer is characterized by regions in which a minor portion of the chlorine atoms along the polymer chain are distributed in a nonstatistical blocktype fashion while the remainder of the polymer is chlorinated in a random manner characteristic of that obtained by solution chlorination techniques, wherein said chlorinated olefin polymer has a relative crystallinity of less than about 10 percent and forms individual sheeting materials having a tensile strength of at least about 1,000 pounds per square inch, an elongation of between about 200 and 1,000 percent and a 100 percent modulus of between about 150 and 400 pounds per square inch; and
2. between about 5 and less than 30 percent by weight of a post-chlorinated polyvinyl chloride containing from about 60 to 72 percent chlorine; said thermoplastic sheeting material having a thickness of about 0.005 to 0.25 of an inch and having an ultimate tensile strength of at least about 1,200 pounds per square inch at 23°C. as determined by ASTM Test Number D-412 and a stiffness of less than about 2,500 pounds per square inch at 25°C. as determined by ASTM Test Number D-797.

3,856,892
O-(1-METHYL-2-ALKYLMERCAPTO-VINYL)-PHOSPHORIC ACID ESTER AMIDES

Wilhelm Sirrenberg, Sprockhovel, and Ingeborg Hammann, Koeln, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

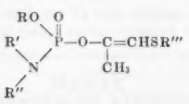
Filed Jan. 31, 1973, Ser. No. 328,217

Claims priority, application Germany, Feb. 2, 1972, 2204770

Int. Cl. A01n *9/36;* **C07f** *9/24*

U.S. Cl. 260—948 **7 Claims**

1. An O-(1-methyl-2-alkylmercapto-vinyl)-phosphoric acid ester amide of the formula



in which

R is alkyl of up to 12 carbon atoms optionally substituted by phenyl or cycloalkyl or cyclo-alkenyl of 5 or 6 carbon atoms, halo-lower alkyl, alkoxyalkyl of up to 6 carbon atoms in each alkyl radical, alkenyl of up to 6 carbon atoms, phenyl, cycloalkyl or cycloalkenyl of 5 or 6 carbon atoms,

R‴ is alkyl of up to 6 carbon atoms, and R′ and R″ each independently is hydrogen, lower alkyl optionally substituted by phenyl or cycloalkyl of 5 or 6 carbon atoms, lower alkenyl, alkoxyalkyl of up to 6 carbon atoms in each alkyl radical, phenyl, or cycloalkyl of 5 or 6 carbon atoms.

3,856,893
HYBRID IONIC PHOSPHORUS COMPOUNDS

Helmut Diery, Kelkheim,Taunus, and Ulrich Cuntze, Hofheim,Taunus, both of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

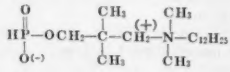
Filed Dec. 13, 1972, Ser. No. 314,753

Claims priority, application Switzerland, Dec. 13, 1971, 18148/71

Int. Cl. C07f *9/08*

U.S. Cl. 260—924 **4 Claims**

1. Compounds of the general formula



in which R^1 represents hydrogen or the methyl group, R^2 and R^3 which may be identical or different, each represent hydrogen or alkyl groups of 1 to 4 carbon atoms, and X represents an ammonium group of the general formula

$$-N^+R^4R^5R^6$$

in which R^4 represents hydrogen, an alkyl or alkenyl group of 1 to 12 carbon atoms or a group of the formula $-(C_nH_{2n}O)_zH$; R^5 represents hydrogen or an alkyl or alkenyl radical of 1 to 20 carbon atoms or a group of the formula $-(C_nH_{2n}O)_zH$ and R^6 represents an alkyl or alkenyl radical of 1 to 20 carbon atoms or a group of the formula $-(C_nH_{2n}O)_zH$ in which n stands for 2 or 3, and the sum of all values of z represents 1 to 50, and wherein at least one of the radicals R^4, R^5 and R^6 represents an alkyl or alkenyl containing at least 8 carbon atoms.

3,856,894
VINYL CHLORIDE POLYMER COMPOSITION CONTAINING A CROSS-LINKED METHYL METHACRYLATE COPOLYMER

Fumio Ide; Mamoru Asao, both of Otake; Akira Hasegawa, Hiroshima, and Isao Sasaki, Iwakuni, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 211,663, Dec. 23, 1971, abandoned. This application Oct. 23, 1973, Ser. No. 408,448

Claims priority, application Japan, Dec. 26, 1970, 45-129610

Int. Cl. C08f *29/24*

U.S. Cl. 260—899 **4 Claims**

1. A vinyl chloride polymer composition comprising:
   i. 70 to 99.9 percent by weight of a vinyl chloride polymer containing 70 to 100 percent by weight of vinyl chloride and 0 to 30 percent by weight of at least one other copolymerizable monomer; and
   ii. 0.1 to 30 percent by weight of a copolymer consisting of methyl methacrylate, 5 to 39 percent by weight of at least one other copolymerizable monofunctional vinyl monomer and 0.005 to 2.0 percent by weight of at least one copolymerizable polyfunctional monomer.

3,856,895
PHOSPHONAMIDES

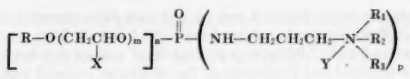
Fred S. Eiseman, Jr., 516 Summit Ave., Maplewood; Leslie M. Schenck, 1558 Grouse Ln., Mountainside, both of N.J., and John P. G. Beiswanger, 720 Coleman St., Easton, Pa.

Filed Oct. 4, 1968, Ser. No. 765,001

Int. Cl. C07f *9/24*

U.S. Cl. 260—945 **7 Claims**

1. A compound of the formula:



wherein R represents an alkyl, phenyl or alkylsubstituted phenyl radical having 7 to about 25 carbon atoms, X represents hydrogen, methyl or ethyl, R_1 and R_2 are members of the group consisting of alkyl and hydroxy alkyl radicals of from 1–3 carbon atoms, R_3 is a hydroxy alkyl radical of from 1–4 carbon atoms, Y is an anion, *m* is an integer of from 1–10, *n* is an integer of from 1–2, and p is an integer of from 1–2, and the sum of $n + p = 3$.

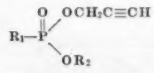
3,856,896

ALKYL PROPARGYL PHOSPHONATES

John D. Hagarty, Sturtevant, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Feb. 9, 1973, Ser. No. 331,165
Int. Cl. A01n 9/36; C07f 9/40
U.S. Cl. 260—956 **9 Claims**

1. A compound of the formula:



wherein R_1 is a straight or branched chain alkyl group having 2–12 carbon atoms and R_2 is propargyl, butyl carbityl or a lower alkyl group having 1–5 carbon atoms.

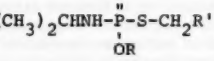
3,856,897

PHOSPHORAMIDOTHIOATES

Hsing Y. Fan, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed May 15, 1972, Ser. No. 253,031
Int. Cl. A01n 9/36; C07f 9/24
U.S. Cl. 260—959 **4 Claims**

1. Isopropylphosphoramidothioates of the formula



where R is alkyl of one to five carbon atoms; and R′ is naphthyl, or phenyl substituted by one or more substituents selected from halogen and alkyl of one to five carbon atoms or by halomethyl.

3,856,898

SEPARATION OF AMORPHOUS SULFUR AND O,O-DI(C1–C8 ALKYL) PHOSPHORO-CHLORIDOTHIOATE

William Russell Diveley, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 237,533, March 23, 1972, abandoned. This application Jan. 21, 1974, Ser. No. 435,353
Int. Cl. C07f 9/14
U.S. Cl. 260—990 **13 Claims**

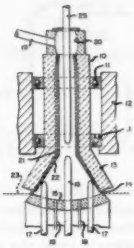
1. In a process for making O,O-(C_1–C_8 dialkyl) phosphorochloridothioate by the chlorination at −5° – 0° C. of O,O-(C_1–C_8 dialkyl) hydrogen phosphorodithioate or a salt thereof, followed by treatment with H_2S at 0°–25° C., whereby a reaction mixture consisting essentially of O,O-(C_1–C_8 alkyl) phosphorochloridothioate and thermally unstable amorphous sulfur at a concentration up to about one-third of the weight of said phosphorchloridothioate is obtained, the improvement which comprises: establishing said mixture in a first temperature range in which substantially all of said amorphous sulfur can go into solution without substantial decomposition of the phosphorochloridothioate, and maintaining it in that range until substantially all of said sulfur has gone into solution; establishing the resulting solution in a lower temperature range in which the solubility of the sulfur in said solution is substantially decrease, and maintaining said solution in said range until precipitation of sulfur is substantially complete, whereby crystalline sulfur is obtained; and separating by settlement substantially all of the precipitated sulfur from the mother liquor.

3,856,899

METHODS FOR MAKING BEADS

Charles W. Schott, 175 Carmella Dr., Pittsburgh, Pa. 15131

Continuation-in-part of Ser. No. 35,962, May 11, 1970, Pat. No. 3,694,528. This application Sept. 22, 1972, Ser. No. 291,262The portion of the term of this patent subsequent to Sept. 26, 1989, has been disclaimed.
Int. Cl. B01j 2/12
U.S. Cl. 264—8 **6 Claims**



1. A method of making pellets comprising the steps of:

a. continuously rotating a member having a generally hollow frusto conical end and carrying material to be pelletized about a vertical axis;

b. heating said material to be pelletized in a controlled atmosphere in said frusto conical end to m-intain a molten generally frusto conical layer of material within said member sufficiently fluid to flow across the frusto conical end;

c. discharging the molten material as spheres from a rotating circular edge of said member at the large end of said frusto conical layer; and

d. cooling the discharged material to solidify the same.

3,856,900

PRODUCTION OF SPHERICAL POLYVINYL CHLORIDE PARTICLES

Edward R. Erb, Milford Township, Bucks City, Pa., assignor to GAF Corporation, New York, N.Y.

Filed Dec. 27, 1972, Ser. No. 319,035
Int. Cl. B29b 1/00; B29c 23/00
U.S. Cl. 264—9 **28 Claims**

1. A method for the production of essentially spherical, plasticized polyvinyl chloride particles having an advantageously narrow particle size distribution comprising:

a. gradually adding a liquid polyvinyl chloride plastisol composition to an agitated liquid medium substantially immiscible therewith and maintained at a temperature of from about 100° F to about 140° F, said plastisol being thereby dispersed as relatively small droplets of essentially spherical form having a particle size not exceeding about 0.03 inch;

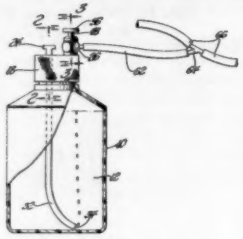
b. heating said dispersion in liquid medium to a temperature within the range of from about 150° F to about 350° F with continued agitation to achieve gelation of said droplets at a desired size not exceeding about 0.03 inch, and c. separating the resulting plasticized polyvinyl chloride particles from said liquid medium, whereby the plasticized particles are obtained as small essentially spherical particles of relatively narrow particle size distribution with advantageous, essentially dust free and free flowing characteristics.

3,856,901

VAPOR INDUCTION SYSTEM

James W. Neumann, and Douglas L. Yielding, both of Port Huron, Mich., assignors to TVI marketing Inc., Lexington, Mich., by said Newman

Filed Oct. 25, 1972, Ser. No. 300,579
Int. Cl. F02m *25/02*
U.S. Cl. 261—18 A **2 Claims**



1. A catalitic fluid vapor mist induction system for use with internal combustion engines, and comprising; a fluid container having a closure member provided thereon and including a fresh air inlet and a vapor mist outlet provided within said closure member, a liquid level of vapor mist fluid provided within said container and an air inlet tube connected to the fresh air inlet and extending below said liquid level, and means connected to said vapor mist outlet and for connection to the induction system of an internal combustion engine for inducing air flow through the fresh air inlet and from the end of said tube beneath said liquid level for bubbling to the surface thereof, and a metering means within said vapor mist outlet for pre-determination of the extend of said bubbling and the vapor mist created thereby for induction to said engine, said fluid container being of a shatter-proof translucent plastic material for enabling relative care-free handling in the refilling thereof and visual inspection of the extent of bubbling occuring therewithin, a filler neck formed on said container centrally disposed and of lesser circumferential size than the fluid retaining portion of said contaier, said container including a relatively domed cover wall between the fluid retaining portion thereof and said filler neck for vapor mist collection and direction towards said filler neck and a return run-off of condensation towards said fluid retaining portion, a sealing bead provided peripherally about said filler neck for sealing engagement with said closure member, and said closure member including a metal closure cap of appropriate size threaded for engagement with said filler neck and for providing sealing engagement between said sealing bead and said cap; said fresh air inlet including an opening provided through the cover wall of said closure cap and a one piece member press fitted and sealed within said cover wall opening and having an air passage provided therethrough, said one piece member being of sufficient length to extend through said cover wall opening on opposite sides thereof for receiving said air inlet tube in self sealing engagement on the inner disposed end thereof and a filter screen member in self-sealing engagement on the outer disposed end thereof, and a filter screen member of such size and material as permits press fitted self-sealing engagement over the outer disposed end of said one piece member and includes a relatively enlarged inlet end having a filter screen therein for the filter screen protection of said air passage and the terminal end protection of the otherwise exposed end of said one piece member through which said air passage extends, said vapor mist outlet including an opening through the cover wall of said closure cap next adjacent and apart from said fresh air inlet opening and threaded to receive a screw machine part in engagement therewithin, a screw machine part threaded for sealing and locking engagement within said outlet opening and having a flow metering orifice provided therewithin, and a barbed hose connection part having a flow passage therethrough for press fitted engagement into said screw machine part and providing outlet communication with the flow metering orifice therewithin and for vapor mist induction by said engine.

3,856,902

MOLDING PROCESS FOR FOAMED ARTICLES USING AN EXPANDABLE MOLD WITH INNER AND OUTER RESTRAINTS

Harold B. Kirkpatrick, Easton, Conn., assignor to Reichhold Chemicals, Inc., White Plains, N.Y.

Filed Oct. 24, 1972, Ser. No. 299,758
Int. Cl. C29d *27/00*
U.S. Cl. 264—45.2 **3 Claims**

1. Process for molding foam-forming synthetic resinous compositions into predetermined shapes comprising the steps of providing an expandable mold formed of an elastomer capable of being expanded to a size greater than its original surface dimensions, positioning said mold so that its outward expansion is restrained by at least two exteriorly placed restraining elements which are not integral with said mold and which are capable of limiting the expansion of portions of the mold while other portions are free to undergo expansion, and by at least one interiorly placed inner restraint which is not integral with said mold and which is capable of limiting the expansion in an inner direction, inserting into said mold a predetermined amount of foam-forming synthetic resinous composition and expanding until restrained by said inner and outer restraints and allowing other portions of said mold to undergo unrestrained expansion and allowing said foamed composition to cure and solidify within said expandable mold.

3,856,903

METHOD OF MOLDING EXPANDABLE POLYSTYRENE

Paul R. Schaeffer, Paoli, Pa., assignor to The Alan I. W. Frank Corporation, Pittsburgh, Pa.

Filed Jan. 31, 1973, Ser. No. 328,172
Int. Cl. B29d *27/00*
U.S. Cl. 264—51 **3 Claims**

1. A method of molding expandable polystyrene comprising admixing expandable polystyrene beads with mineral oil in the proportions of **1** to **6** grams of mineral oil to **10** pounds of expandable polystyrene beads, expanding the polystyrene beads admixed with mineral oil, introducing the expanded polystyrene into a mold and applying heat to fuse the expanded polystyrene into an article having the shape of the

mold, the mineral oil having the effect of reducing the time of application of heat required for adequate fusion of the expanded polystyrene into the article having the shape of the mold.

3,856,904

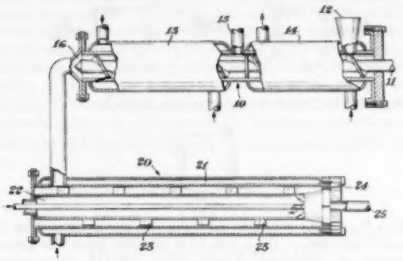
PROCESS FOR MAKING EXPANDED SYNTHETIC RESINOUS BEADS

Ralph E. Ayres, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 162,252, July 13, 1971, abandoned, which is a continuation-in-part of Ser. No. 31,747, April 24, 1970, abandoned. This application Oct. 19, 1973, Ser. No. 408,241

Int. Cl. B29d *27/00*; **B29f** *3/04*

U.S. Cl. 264—51 **8 Claims**



1. In a method for the preparation of foamed beads of synthetic resinous thermoplastic material from a foamable, extrudable synthetic thermoplastic resinous composition wherein the resinous composition is intermittently extruded in a heat plastified form, the composition comprising a synthetic thermoplastic resinous composition which is extrudable and foamable, the resinous composition being intermittently extruded under continuously applied pressure through a plurality of constricted passageways by a valving means into a plurality of open outlets in a zone of lower pressure to provide a plurality of closely adjacent sequentially extruded globules, the improvement which comprises permitting in said zone of lower pressure the sequentially extruded globules of the composition in closely adjacent relationship to expand and cause the globules to thereby adhere together to form strands, the strands consisting essentially of a plurality of foamed particles adhered together, and subsequently applying mechanical agitation to said strands sufficient to separate the strands into individual particles.

3,856,905

ORIENTED PLASTIC TUBE

David H. Dawson, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sept. 22, 1972, Ser. No. 291,288

Int. Cl. B29c *17/07*; **B29d** *23/03*

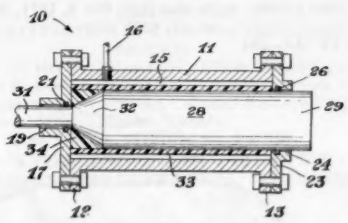
U.S. Cl. 264—89 **7 Claims**

1. A method for the preparation of a conduit, the conduit having a plastic liner tube and an outer housing having a liner receiving cavity, the plastic liner tube being of a synthetic thermoplastic composition, the method comprising

plastically deforming the tube at a temperature above its glass temperature and a temperature below its softening point to radially compress the tube to a diameter smaller than its original diameter without increasing the length of the tube,

reducing the temperature of the tube below the temperature at which it was deformed,

positioning the tube within an outer housing in a tube receiving cavity, and



heating the tube to a temperature above the temperature of plastic deformatin and below its softening point to cause radial expansion of the tube within the cavity.

3,856,906

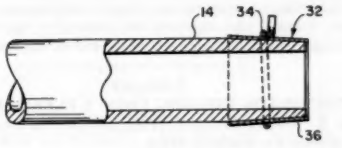
METHOD FOR FORMING THREADS ON PLASTIC NIPPLES

James S. Edgar, 1306 S. Columbus Airport No. 3, Columbus, Ohio 43207

Filed Mar. 12, 1973, Ser. No. 340,462

Int. Cl. B29c *1/12*; **B29d** *1/00*

U.S. Cl. 264—138 **4 Claims**



1. A process of forming threads on the end of a cylindrical plastic tube comprising:

a. removing material from the inside surface of the tube at the end to be threaded, said removal comprising cutting the material away to form a frusto conical interior surface diverging toward the open end of the tube at an angle not substantially greater than 3½°,

b. heating the end of the tube to be threaded and deforming it radially inward to reform the interior surface of the tube to roughly a cylindrical surface while reforming the exterior surface at the end of the tube to a frusto conical surface converging toward the end of the tube,

c. gripping the heated and deformed end of the tube with segmented dies, said dies having a thread form pattern on their inner surface in contact with said heated tube end,

d. applying radial pressure from within the tube against its interior surface to plastically deform said tube radially against the dies with force sufficient to cause plastic flow of the heated end into the thread form pattern of said dies and

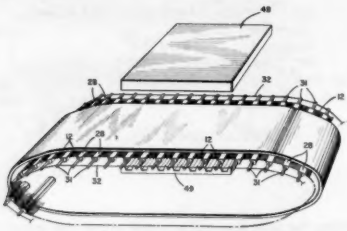
e. cooling the tube by application of cooling fluid to quickly freeze the thread form pattern on the end of the tube and prevent damage to the thread due to the soft nature of the hot plastic.

3,856,907

PROCESS FOR MANUFACTURING TOOTHED BELTS

Marion Cicognani, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed Oct. 4, 1972, Ser. No. 294,982
Claims priority, application Italy, Oct. 6, 1971, 29542/71
Int. Cl. B29h 9/02
U.S. Cl. 264—254 2 Claims



1. A process for manufacturing toothed belts of elastomeric material, comprising applying transversally on a band of rubberized fabric a plurality of listels spaced apart at regular intervals from one another, causing said rubberized fabric to contact a part of the outer surface of said listels; closing the fabric provided with the listels in the form of a ring on a support; applying a winding of cords on the ring of fabric, provided with listels, while it is supported; forming a layer of elastomeric material on the winding of cords, originating in this way transversally rigid annular sleeve; removing the transversally rigid sleeve from the support; positioning a given portion of said annular sleeve in a mold cavity; removing the listels from said given portion of the transversally rigid sleeve; molding the elastomeric material of the sleeve portion into the mold cavity to fill said cavity including the space, from which the listels have been removed while simultaneously curing the sleeve portion, and repeating the removal of the listels and molding while curing until the whole sleeve has been treated.

3,856,908

PROCESS FOR MOLDING FROM A FLEXIBLE MOLD

Jack R. Harper, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 816,779, April 16, 1969, Pat. No. 3,615,071. This application Oct. 12, 1970, Ser. No. 80,189
Int. Cl. B29c 1/04
U.S. Cl. 264—313 10 Claims

1. In a method of forming a shaped article consisting essentially of placing a curable, catalyzed, polymeric material selected from the group consisting of polyester, polyurethane and epoxy resin in a flexible mold, curing said polymeric material and thereafter removing the shaped article from the mold, the improvement consisting essentially of applying a thin continuous film of a methyl ethyl ketone soluble copolymer of vinylidene chloride and acrylonitrile on the shape forming surface of said flexible mold before placing the curable, catalyzed, polymeric material in the flexible mold.

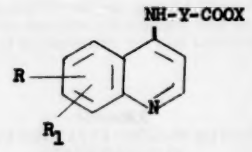
3,856,909

NOVEL QUINOLINES IN THE TREATMENT OF PAIN AND INFLAMMATION

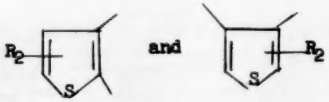
Andre Allais, Les Lilas; Jean Meier, Coeuilly-Champigny, and Jean Cerede, Dugny, all of France, assignors to Ranssel Uclaf, Paris, France

Division of Ser. No. 241,405, April 5, 1971, Pat. No. 3,808,216. This application Jan. 28, 1974, Ser. No. 437,151
Claims priority, application France, Apr. 8, 1971, 71.12460
Int. Cl. A61k 27/00
U.S. Cl. 424—258 19 Claims

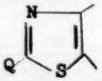
1. An analgesic and anti-inflammatory composition comprising an effective amount of a compound selected from the group consisting of 4-amino-quinolines of the formula



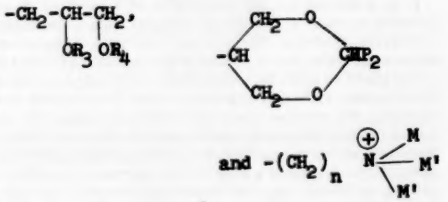
wherein R is selected from the group consisting of hydrogen, halogen, $-CF_3$, lower alkyl, lower alkoxy, lower alkylsulfonyloxy, lower alkylthio, nitro, lower alkylamino, lower alkanoylamino and cyano. R_1 is selected from the group consisting of hydrogen, chlorine and methyl, Y is selected from the group consisting of 2,3 and 3,4-disubstituted thiophenes of the formula



and 4, 5 disubstituted thiazoles of the formula



wherein R_2 and Q are selected from the group consisting of hydrogen and lower alkyl and X is selected from the group consisting of hydrogen, lower alkyl, phenyl, diloweralkylamino lower alkylene,



Z^-, R_3 and R_4 being hydrogen and taken together form

P and P_1 are lower alkyl, P_2 is selected from the group consisting of lower alkyl, M and M′ are lower alkyl, Z is halogen and n is an integer from 1 to 6 and their non-toxic, pharmaceutically acceptable acid addition salts and a pharmaceutical carrier.

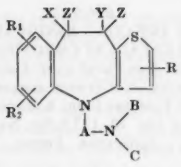
3,856,910

NOVEL THIENOBENZAZEPINES AS ANTI-DEPRESSANTS

Lucien Nedelec, Le Raincy; Jacques Guillaume, Aulnay-sous-Bois, and Andre Allais, Les Lilas, all of France, assignors to Roussel-Uclaf, Paris, France

Division of Ser. No. 230,124, Feb. 28, 1972, Pat. No. 3,787,445. This application Oct. 24, 1973, Ser. No. 409,144
Claims priority, application France, Mar. 1, 1971, 71.06917
Int. Cl. A61k 27/00
U.S. Cl. 424—275 11 Claims

1. An antidepressant composition comprising an effective amount of a compound selected from the group consisting of 4-(α-alkylaminoalkyl)-[4H]-thieno-[3,2-b] [f]-benzazepine of the formula



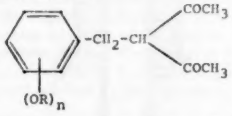
wherein R_1 and R_2 are selected from the group consisting of hydrogen, halogen, $-CF_3$, lower alkoxy, lower alkylthio, lower alkyl, sulfonamido and diloweralkylamino, R is selected from the group consisting of hydrogen and lower alkyl, A is alkylene of two to five carbon atoms optionally substituted by lower alkyl, B is selected from the group consisting of hydrogen and lower alkyl, C is lower alkyl, Y is selected from the group consisting of hydrogen, hydroxy, lower alkoxy and lower alkanoyloxy, X is hydrogen or taken together with Y forms a carbon-carbon double bond, z′ is selected from the group consisting of hydrogen and lower alkyl and Z is selected from the group consisting of hydrogen, lower alkyl and lower alkoxy or taken with Y forms a member of the group consisting of =0, lower alkylenedioxy, lower alkylenedithio and thioloweralkyleneoxy and a non-toxic, pharmaceutically acceptable acid addition salt thereof a pharmaceutical carrier therefor.

3,856,911
CHOLAGOGIC COMPOSITION CONTAINING PENTANEDIONE DERIVATIVES

Hajime Yokotani, Osaka; Masuo Miyamoto, Kyoto, and Tadakazu Murata, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 56,971, July 21, 1970, Pat. No. 3,708,540. This application Sept. 28, 1972, Ser. No. 293,169
Claims priority, application Japan, July 21, 1969, 44-57562
Int. Cl. A61k *27/00*
U.S. Cl. 424—331 **3 Claims**

1. A method of administering to a human in need of a cholagogic agent an effective cholagogic amount of a composition consisting essentially of, as the active ingredient, a compound of the formula:



wherein R is a hydrogen atom or a lower alkyl group and *n* is an integer of 1 to 3, and a pharmaceutical carrier therefor.

3,856,912
RECOVERY OF PLATINUM FROM DEACTIVATED CATALYSTS

Kenneth Donald Vesely, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

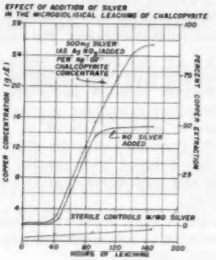
Filed May 3, 1973, Ser. No. 357,042
Int. Cl. C01g *55/00*
U.S. Cl. 423—22 **2 Claims**

1. A method for the recovery of platinum from a deactivated catalyst composite comprising platinum on an alumina support, which comprises the steps of digesting said composite in sulfuric acid to dissolve the alumina, separating the resultant aluminum sulfate solution from the undissolved platinum-containing residue, commingling said solution with a liquid trialkyl phosphate having from one to five carbon atoms in each of the alkyl groups, maintaining the resultant mixture at quiescent conditions to separate the same into upper and lower liquid layers with a platinum-containing residue at the interface, withdrawing the last-mentioned residue and combining the same with said undissolved platinum-containing residue from the digesting step, digesting the combined residues with aqua regia to dissolve the platinum and form chloroplatinic acid, and recovering said chloroplatinic acid.

3,856,913
COPPER EXTRACTION BY RAPID BACTERIOLOGICAL PROCESS

Roderick O. McElroy, Vancouver, British Columbia, and Douglas W. Duncan, W. Vancouver, British Columbia, both of Canada, assignors to British Columbia Research Council, Vancouver, British Columbia, Canada

Filed Sept. 21, 1972, Ser. No. 290,950
Int. Cl. B01d *11/00;* **B01f** *1/00;* **C01g** *5/00, 7/00*
U.S. Cl. 423—27 **13 Claims**


EFFECT OF ADDITION OF SILVER IN THE MICROBIOLOGICAL LEACHING OF CHALCOPYRITE
500mg SILVER (AS Ag NO3) ADDED PER kg OF CHALCOPYRITE CONCENTRATE
NO SILVER ADDED
STERILE CONTROLS W/NO SILVER
COPPER CONCENTRATION (g/L)
REDOX POTENTIAL (mV)
HOURS OF LEACHING

1. In a process for rapid bacteriological extraction of copper by leaching from particulate materials in pulp form of a density of from about 2 to about 60% such as ores and concentrates containing chalcopyrite in an aqueous acidic leaching medium containing sulfide oxidizing bacteria and a nutrient for said bacteria and under agitation and aeration with air enriched with carbon dioxide, the step which comprises adding silver to said leaching pulp, said silver being in an amount of at least about 200 mg/Kg of solid material.

3,856,914
METHOD OF MAKING A POROUS POLYMERIC MATERIAL

Moriichi Maeda, Tokyo; Akio Onuki, Mitaka, and Kazuya Kusano, Tokyo, all of Japan, assignors to Kinyo-Sha Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 150,958, June 8, 1971, abandoned. This application Sept. 4, 1973, Ser. No. 393,977
Claims priority, application Great Britain, June 8, 1971, 19452/71; Germany, June 15, 1971, 2129706; France, June 15, 1971, 71.21643
Int. Cl. B29d *27/00*
U.S. Cl. 264—41 **8 Claims**

1. A method of making a porous polymeric material comprising a plurality of interconnected cells, which method comprises:

a. mixing together 100 parts of a liquid prepolymer which can be converted from liquid to solid form by cross-linking during step (b), at least 40 parts of an inert organic liquid which is insoluble in the prepolymer and does not boil under the conditions of step (b) and 1.5 to 15 parts of an emulsifier the emulsifying action of which is progressively decreased when heated in the presence of the cross-linking agent for the prepolymer used in step (b) to form a stable emulsion of dispersed liquid prepolymer in the organic liquid;

b. heating the emulsion to at least 90° C in the presence of a cross-linking agent for the prepolymer to coagulate the prepolymer dispersion into larger particles and to solidify these particles and bond them together to form a porous

polymeric material with a plurality of interconnected cells filled with the organic liquid; and

c. extracting the organic liquid from the cells.

3,856,915

SOLVENT RECYCLE PROCESS FOR RECOVERY OF RHENIUM FROM MOLYBDATE SOLUTIONS

L. Rita Pagnozzi; Tai K. Kim; John M. Laferty, and Martin B. MacInnis, all of Towanda, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 19, 1972, Ser. No. 255,233
Int. Cl. C01g 47/00
U.S. Cl. 423—49 5 Claims

1. In a process for the recovery of rhenium from aqueous molybdate solutions wherein an organic extractant solution is used to selectively extract rhenium from said molybdate solution and is thereafter stripped with a rhenium stripping agent to remove rhenium from the organic, the improvement comprising:

a. establishing an initial rhenium extraction efficiency of an organic extraction solution comprising a quaternary amine as the active extractant, a primary alcohol as a solubilizer and an aliphatic solvent,

b. measuring the rhenium extraction efficiency of said organic extraction solution after contact with said molybdate solution and subsequent contact with said rhenium stripping agent,

c. adding sufficient organic active extractant to said organic extraction solution to attain substantially the initial rhenium extraction efficiency, and

d. recycling said organic after said addition to contact said molybdate solutions.

3,856,916

PROCESS FOR PREPARING CHROMIUM SULPHATE FROM RESIDUAL SOLUTIONS CONTAINING HEXAVALENT CHROMIUM COMPOUNDS

Robert Lefrancois; Jacques Denoyers, both of Paris, and Michel Gabriel, Casablanca, all of Franc:, assignors to Societe Anonyme Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Apr. 12, 1973, Ser. No. 350,503
Int. Cl. C01g 37/08
U.S. Cl. 423—54 6 Claims

1. In a process for preparing a chromium sulphate from residual solutions containing hexavalent chromium compounds comprising contacting a residual solution containing hexavalent chromium compounds at a pH in the range of 0 to 6 with an anionic exchange resin whereby hexavalent chromium is fixed on said anionic exchange resin, eluting said anionic exchange resin containing fixed hexavalent chromium by contacting with an aqueous elution solution containing a reducing agent, and recovering an aqueous solution containing a chromium sulphate, the improvement consisting of utilizing an aqueous solution of sulphur dioxide in the presence of sulphuric acid as said aqueous elution solution.

5. A process for preparing a chromium sulphate from residual solutions containing hexavalent chromium compounds comprising contacting an aqueous acidic residual solution containing hexavalent chromium compounds with a water-insoluble organic solvent capable of dissolving hexavalent chromium compounds and resisting oxidation in a strongly acid medium, separating said organic solvent containing hexavalent chromium compounds dissolved therein from the aqueous acidic residual solution depleted in hexavalent chromium compounds, extracting said organic solvent containing hexavalent chromium compounds by contacting with an aqueous extraction solution of sulphur dioxide in the presence of sulphuric acid, separating the exhausted organic solvent for recycling, and recovering an aqueous solution containing a chromium sulphate.

3,856,917

PROCESS FOR TREATING RESIDUAL SOLUTIONS CONTAINING HEXAVALENT CHROMIUM COMPOUNDS

Nicole Texier, Paris; Jean-Pierre Cuer, Colombes, and Michel Gabriel, Casablanca, all of France, assignors to Societe Anonyme Products Chimiques Ugine Kuhlmann, Paris, France

Filed Apr. 12, 1973, Ser. No.
Claims priority, application France, Apr. 14, 1972, 72.13318
Int. Cl. C01g 37/14
U.S. Cl. 423—54 9 Claims

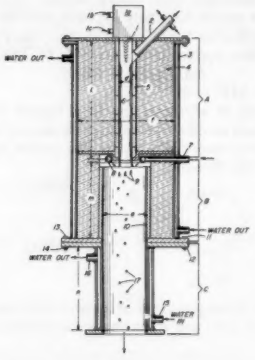
1. In a process for treatment of a residual solution containing a hexavalent chromium compound to render said solution non-polluting, comprising the steps of subjecting said solution to a liquid-liquid extraction with a water-insoluble organic solvent to dissolve substantially all of the said hexavalent chromium compound to form an organic solution thereof, and reextracting said dissolved hexavalent chromium compound from said organic solution with an aqueous solution; the improvement comprising using, for said reextraction of said dissolved hexavalent chromium compound from said organic solution, an aqueous sodium chromate solution, to produce a concentrated sodium bichromate solution.

3,856,918

PROCESS FOR THE BENEFICIATION OF TITANIFEROUS ORES UTILIZING HOT WALL CONTINUOUS PLASMA REACTOR

Joseph Francis Skrivan, and John Donald Chase, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 28, 1973, Ser. No. 345,606
Int. Cl. C01g 23/04
U.S. Cl. 423—69 8 Claims



1. A process for beneficiating titaniferous ores utilizing a hot wall continuous plasma jet reactor adapted for the production of at least a 90 percent TiO_2 material having in combination a vertically positioned, elongated, water-cooled casing having an upper hot wall reactor zone, a middle reactor base zone, and a lower cool wall zone, said upper hot wall reactor zone having means for introducing a plasma reducing gas, means for introducing titaniferous feed material into the latter chamber on which molton slag flows, said reactor zone having a length to diameter ratio greater than 3; said middle reactor base zone having a vertical chamber of diameter equal to at least three times that of the diameter in said upper hot wall reactor zone, and means for quenching said molten slag immediately emanating from the said upper reaction zone so as to form discrete drops or particles; and said lower cool-wall zone having a water-cooled chamber, which comprises the steps of: introducing a ground low-grade titaniferous ore comprising titanium and iron values into a reaction zone of said plasma jet

reactor where oxides of iron in the ore are partially or completely reduced by hot hydrocarbon gas in which the length to diameter ratio of the reaction zone is at least 3, contacting and melting said ore with a reducing gas effluent of a plasma torch or arc for a period from 0.01 to 5.0 minutes, flowing molten ore predominantly on the walls of said reaction zone, quenching the molten ore at the base of the said upper reaction zone so as to break-up molten ore into droplets thereby solidifying the molten ore after said quench in a reactor base zone, effecting free fall of the so broken-up and solidified material through said reactor base zone without touching the wall of said latter reactor, and recovering said solidified droplet containing at least about 90 percent TiO_2.

3,856,919

OPHTHALMIC SOLUTION

Billy F. Rankin, Rockville, Md., assignor to Burton, Parsons Chemicals, Inc., Washington, D.C.

Division of Ser. No. 44,564, June 8, 1970, Pat. No. 3,767,788, which is a continuation-in-part of Ser. Nos. 773,947, Nov. 6, 1968, abandoned, and Ser. No. 881,336, Dec. 1, 1969, abandoned. This application Jan. 19, 1973, Ser. No. 324,983

Int. Cl. A61k *17/00*

U.S. Cl. 424—78 **14 Claims**

1. An opthalmic solution (comprising) consisting essentially of an aqueous solution of an ethylene oxide polymer, having a molecular weight of at least about 100,000, in an amount from about 0.05 to 2.0 weight percent sufficient to provide a viscosity of from about 0 to 30,000 cps. and up to about 500 weight percent, based on the weight of the ethylene oxide polymer, of an opthalmic medicament.

3,856,920

RECOVERY OF GALLIUM OXIDE FROM SOLUTIONS

Harry C. Snyder, Jr., Belleville, Ill., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed May 22, 1972, Ser. No. 255,522

Int. Cl. C01f *7/18*; **C01g** *15/00*

U.S. Cl. 423—122 **1 Claim**

1. The method of precipitating gallium oxide from sodium aluminate solutions containing dissolved gallium, comprising feeding into the solution sufficient carbon dioxide to co-precipitate alumina and part of the gallium oxide from the solution and produce sodium bicarbonate in the solution, and thereafter co-precipitating further alumina and gallium oxide from the resultant solution by feeding sodium aluminate into that solution.

3,856,921

PROMOTING SCRUBBING OF ACID GASES

Adam L. Shrier, Montclair, N.J., and Peter V. Danckwerts, Cambridge, England, assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 057,303, July 22, 1970, abandoned. This application Nov. 10, 1971, Ser. No. 197,370

Int. Cl. B01d *53/34*

U.S. Cl. 423—228 **9 Claims**

1. In a process for the removal of acidic components, said acidic components being selected from the group consisting of H_2S, CO_2, SO_2, SO_3, CS_2, HCN, HCl, COS, and the oxygen and sulfur derivatives of C_1 to C_4 hydrocarbons from gases, which comprises contacting said gas with an aqueous solution comprising a basic salt, selected from the group consisting of potassium carbonate, sodium carbonate, potassium hydroxide and sodium hydroxide, the improvement comprising contacting said gas and said solution in the presence of an amine selected from the group consisting of 2-methylaminoethanol, 2-ethylaminoethanol, morpholine, and pyrrolidine.

3,856,922

PROCESS FOR PREPARING SUBSTANTIALLY NON-CAKING SODIUM CHLORIDE

Robert W. Bragdon, 10 Batchelder Rd., Marblehead, Mass. 01945

Filed Nov. 6, 1973, Ser. No. 413,345

Int. Cl. C01d *3/04*

U.S. Cl. 423—268 **6 Claims**

3. A free-flowing non-caking sodium chloride composition consisting essentially of crystalline sodium chloride and N-2-acetamide iminodiacetic acid or N,N-bis-(2,2'-acetamido)-glycine in an amount effective for rendering the compositon non-caking.

3,856,923

PROCESS FOR PREPARING 1,1'-PEROXYDICYCLOHEXYLAMINE

Terance Washford North, Teran, Laddingford, Maidstone, England

Filed Oct. 15, 1970, Ser. No. 81,146

Claims priority, application Great Britain, Oct. 17, 1969, 51094/69

Int. Cl. C07d *85/26*

U.S. Cl. 260—307 F **6 Claims**

1. A process for the production of 1,1'-peroxydicyclohexylamine comprising reacting together cyclohexanone, hydrogen peroxide and ammonia in the presence of ammonium at a temperature of from about 25° to 40°C nitrate.

3,856,924

PRODUCTION OF HYDROXYLAMMONIUM NITRATE

Klaus Kartte, Frankenthal; Hugo Fuchs; Kurt Jockers, both of Ludwigshafen; Kurt Kahr, Hambach, and Hermann Meier, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed Dec. 27, 1971, Ser. No. 212,663

Claims priority, application Germany, Jan. 2, 1971, 2100036

Int. Cl. C01b *21/14*

U.S. Cl. 423—387 **5 Claims**

1. A process for the production of an aqueous solution of hydroxylammonium nitrate by reduction of nitrogen monoxide with hydrogen in dilute aqueous nitric acid in the presence of a supported platinum catalyst wherein a platinum metal catalyst is used which has been partially poisoned with sulfur and prior to the beginning of said reduction has been activated with hydrogen in an aqueous suspension and wherein the nitric acid is supplied as the reaction proceeds in an amount required for the final concentration of hydroxylammonium nitrate.

3,856,925

METHOD FOR MANUFACTURE OF HYDROGEN AND CARBONYL SULFIDE FROM HYDROGEN SULFIDE AND CARBON MONOXIDE

Yoshihide Kodera, Kanagawa; Naoyuki Todo, and Kenzo Fukuda, both of Saitama, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Aug. 17, 1972, Ser. No. 281,409

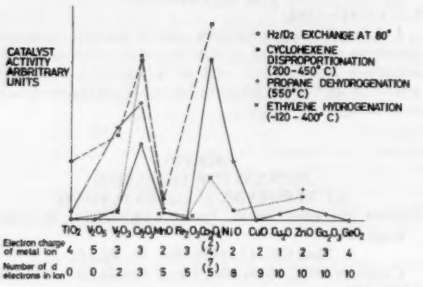
Claims priority, application Japan, Aug. 19, 1971, 46-62574

Int. Cl. C01b *31/26*, *1/03*

U.S. Cl. 423—416 **3 Claims**

1. A method for the manufacture of hydrogen and carbonyl sulfide from hydrogen sulfide and carbon monoxide, which comprises continuously supplying under normal pressure flow a mixed gas of hydrogen sulfide and carbon monoxide to a reaction vessel packed with a catalyst selected from the group consisting of vanadium sulfide, chromium sulfide, molybdenum sulfide, tungsten sulfide, iron sulfide, cobalt sulfide, nickel sulfide, rhodium sulfide, palladium sulfide and platinum

sulfide, said catalyst temperature being between room temperature and a temperature not higher than 500°C., thereby producing hydrogen and carbonyl sulfide from said hydrogen sulfide and carbon monoxide in said reaction vessel, continuously discharging a mixture of hydrogen, carbonyl sulfide, non-reacted hydrogen sulfide and carbon monoxide from said reaction vessel, and separating said hydrogen and carbonyl sulfide from the discharged gas.

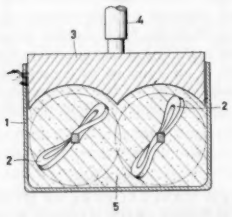

CATALYST ACTIVITY ARBITRARY UNITS
• H2/D2 EXCHANGE AT 80°
• CYCLOHEXENE DISPROPORTIONATION (200–450° C)
• PROPANE DEHYDROGENATION (550° C)
• ETHYLENE HYDROGENATION (-120 – 400° C)
TiO2 V2O5 WO3 Cr2O3 MnO Fe2O3 Co3O4 NiO CuO Cu2O ZnO Ga2O3 GeO2
Electron charge of metal ion 4 5 3 3 2 3 (2 4) 2 2 1 2 3 4
Number of d electrons in ion 0 0 2 3 5 5 (7 5) 8 9 10 10 10 10

3,856,926

PROCESS FOR PREPARING CARBON PASTE

Tokuharu Yamaura, Tokyo; Masayuki Takeda, Ohmachi; Koi Tajima, Ohmachi, and Norio Koike, Ohmachi, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 873,401, Nov. 3, 1969, abandoned. This application June 15, 1972, Ser. No. 263,120
Claims priority, application Japan, Nov. 6, 1968, 43-80627
Int. Cl. C01b *31/04*
U.S. Cl. 423—448 **1 Claim**



1. In a method for producing a carbon body in which a carbon paste is kneaded in a kneader having a Σ or Z shaped rotating wing, the improvement in which:

a. mechanical pressure of 0.2 to 1.0 kg/cm² is applied to the carbon paste in said kneader during the kneading by pressing a plate thereagainst;
b. the binder constitutes **19** to **28**% of said paste;
c. the paste is kneaded for a period of 5 to 60 minutes;
d. the paste is kneaded at a temperature between 20°C and 60°C above the softening point of the binder;
e. the kneaded paste is shaped and baked at a temperature of 800° to 1300°C; and
f. the shaped baked paste is graphitized at a temperature between 2500° and 3400°C to yield said body.

3,856,927

ACCELERATION OF OXIDATION PROCESSES OVER VANADIA CATALYSTS

Peter L. Silveston, 550 Glasgow St., Kitchener, and Robert R. Hudgins, 196 Bellehaven Dr., Waterloo, Province of Ontario, both of Canada

Filed July 12, 1972, Ser. No. 270,933
Int. Cl. C01b *17/76, 17/68*
U.S. Cl. 423—533 **2 Claims**

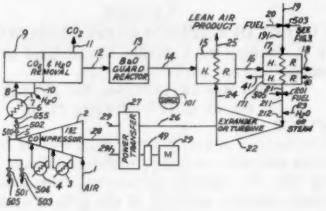
1. In a process for producing sulfur trioxide which comprises passing a gaseous reaction mixture comprising oxygen and sulfur dioxide over vanadium pentoxide catalyst, the improvement which comprises: carrying out the reaction while the ratio of partial pressure of sulfur dioxide to oxygen is varied in cycles from a value selected from the range of about 0.6 to about 1.1 and the positive and negative variations from said value are within the range from about 0.2 to about 0.5 and are of equal magnitude, said cycles being of about 2 to 8 hours duration.

3,856,928

OXYGEN PRODUCTION PROCESS

Paul B. Tarman, Elmhurst, Ill., and Lester G. Massey, Moreland Hills, Ohio, assignors to Consolidated Natural Gas Service Co. Inc., Cleveland, Ohio

Continuation-in-part of Ser. Nos. 242,153, April 7, 1972, Pat. No. 3,773,680, and Ser. No. 241,957, April 7, 1972, Pat. No. 3,773,680. This application June 7, 1972, Ser. No. 260,449The portion of the term of this patent subsequent to Dec. 24, 1991, has been disclaimed.
Int. Cl. C01b *13/08, 15/04*
U.S. Cl. 423—579 **15 Claims**



1. In a process for producing oxygen or enrichment of air by increasing its oxygen content which includes the steps of compressing and heating air to elevated pressure and temperature, passing said air into contact with a bed containing an oxygen acceptor compound to oxidize said compound in an oxidation half cycle, and reducing the pressure over said compound to effect reduction of said compound in a reduction half cycle and recovering an oxygen-containing gas therefrom. the improvement wherein:

a. said bed compound is an active composition of a barium oxide with MgO and CaO,
b. said bed is maintained at a temperature of from about 1,250°F to about 1,600°F,
c. the pressure of air over said bed during said oxidation is maintained in a range of from about 14 to about 385 psia,
d. the pressure over said bed during reduction of said bed is maintained in a range of from about 1 to about 45 psia,
e. the ratio of said oxidation pressure to said reduction pressure is maintained in a range of from about 1.6 to about 15,
f. said half cycles of reduction or oxidation, exclusive of pressurization of depressurization, are maintained for a time of from about **30** to about **360** seconds,
g. said passing of said air through said bed during oxidation is maintained at a space velocity of from about 200 to about 5,000 SCF/cu. ft. bed-hr.,

h. a lean gas is withdrawn from said bed during oxidation having an oxygen concentration of from about 5 to about 15 mole percent, and

i. at least one fraction of product gas is withdrawn from said bed during reduction having an oxygen concentration of above about 22 mole percent.

3,856,929
PRODUCTION OF ANATASE TiO_2 BY THE CHLORIDE PROCESS

Albert Henry Angerman, and Carl Gordon Moore, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

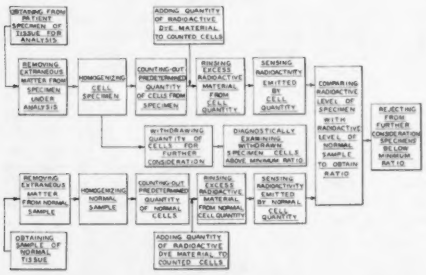
Filed Aug. 25, 1972, Ser. No. 283,768
Int. Cl. C01g *23/04;* **C09c** *1/36*
U.S. Cl. 423—613 **5 Claims**

1. In the chloride process for producing TiO_2 pigment by the oxidation of titanium tetrachloride with an oxygen-containing gas in the vapor phase at an elevated temperature, the improvement for producing at least about 80 weight percentage of anatase of good dispersibility and undertone by effecting the oxidation in the presence of a silicon halide and a phosphorus halide, said halides being gaseous and oxidizable at said temperature, and said halides being present in amounts to provide weight percentage of 0.4 to 1 percent oxidized silicon halide, calculated as SiO_2, and 0.1 to 0.5 percent oxidized phosphorus halide, calculated as P_2O_5, in said pigment.

3,856,930
METHOD OF SCREENING TISSUE SPECIMENS FOR DIAGNOSTIC EXAMINATION

John H. Nodine, Wayne, Pa.; John Herbert Waite; Herbert Waite, both of Haddonfield, and Martin J. Fletcher, Belle Mead, all of N.J., assignors to Bio-Digital Sciences, Inc., Princeton, N.J.

Filed Aug. 16, 1972, Ser. No. 281,168
Int. Cl. A61k *27/04;* **G01n** *23/00*
U.S. Cl. 424—1 **15 Claims**


OBTAINING FROM PATIENT SPECIMEN OF TISSUE FOR ANALYSIS
REMOVING EXTRANEOUS MATTER FROM SPECIMEN UNDER ANALYSIS
HOMOGENIZING CELL SPECIMEN
COUNTING-OUT PREDETERMINED QUANTITY OF CELLS FROM SPECIMEN
ADDING QUANTITY OF RADIOACTIVE DYE MATERIAL TO COUNTED CELLS
RINSING EXCESS RADIOACTIVE MATERIAL FROM CELL QUANTITY
SENSING RADIOACTIVITY EMITTED BY CELL QUANTITY
COMPARING RADIOACTIVE LEVEL OF SPECIMEN WITH RADIOACTIVE LEVEL OF NORMAL SAMPLE TO OBTAIN RATIO
REJECTING FROM FURTHER CONSIDERATION SPECIMENS BELOW MINIMUM RATIO
WITHDRAWING QUANTITY OF CELLS FOR FURTHER CONSIDERATION
DIAGNOSTICALLY EXAMINING WITHDRAWN SPECIMEN CELLS ABOVE MINIMUM RATIO
REMOVING EXTRANEOUS MATTER FROM NORMAL SAMPLE
HOMOGENIZING NORMAL SAMPLE
COUNTING-OUT PREDETERMINED QUANTITY OF NORMAL CELLS
RINSING EXCESS RADIOACTIVE MATERIAL FROM NORMAL CELL QUANTITY
SENSING RADIOACTIVITY EMITTED BY NORMAL CELL QUANTITY
OBTAINING SAMPLE OF NORMAL TISSUE
ADDING QUANTITY OF RADIOACTIVE DYE MATERIAL TO COUNTED CELLS

1. In a process for diagnosing specimens of cells for disease employing the process known per se of

staining a specimen of cells with a radioactively tagged dye, rinsing excess radioactive dye material from the specimen of cells,

sensing the level of radioactivity emitted by the specimen of cells,

comparing the radioactivity emitted by the specimen of cells relative to a standard of comparison obtained by having measured the level of radioactivity emitted by a similar kind of specimen of cells known to be normal, and rejecting from detailed diagnosis consideration of that specimen of cells if its level of radioactivity is less than a predetermined level of activity,

whereby specimens are screened prior to diagnostic examination to reduce the number of specimens to be examined, the improvement comprising,

prior to staining,

counting-out a predetermined quantity of cells from a specimen to be diagnosed,

adding a predetermined quantity of radioactive dye material to the predetermined quantity of cells in relation to the number of cells counted, and

performing at least the step or steps involving radioactive measurement with the predetermined quantity of cells removed from supporting or surrounding matter in which staining was accomplished so that any supporting or surrounding matter which might have been subject to excess stain has been removed.

3,856,931
MEDICATED STICK

Peter Fuchs, and Gisela Schopflin, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Filed Aug. 1, 1972, Ser. No. 277,122
Int. Cl. A61j *3/08;* **A61k** *7/00, 9/06*
U.S. Cl. 424—14 **16 Claims**

1. A solid cosmetic base composition in the shape of cosmetic stick characterized by having a lubricating and emolient effect on the skin without imparting a shine thereto and capable of being readily washed off with water, said composition consisting essentially of, in percent by weight based on the total composition,

10–70 percent solid wax;

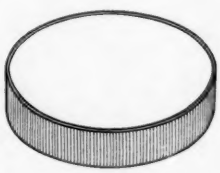
4–35 percent fatty alcohols of 8–30 carbon atoms; and

15–70 percent polyol fatty acid ester mixture consisting essentially of a low-polyhydroxylated monoester mixture of glycerin and carboxylic acids of 8–18 carbon atoms wherein the molecular weight of the low-polyhydroxide is 200–600.

3,856,932
TABLET OF A CHLORINE RELEASING SOLID COMPOUND

Michael Axton May, West Hanningfield, Gay Bower Farm, England

Filed Dec. 16, 1969, Ser. No. 885,494
Int. Cl. B65d *81/00;* **C02b** *3/08;* **A01n** *11/00*
U.S. Cl. 424—16 **6 Claims**



1. A tablet comprised of a chlorine releasing solid chemical compound for use as an agent for sanitizing water, said tablet having substantially parallel plane faces, the surface of the edge between said substantially parallel plane faces is sealed by a continuous band of a water impervious and water insoluble waterproof material, at least one of said substantially parallel plane faces being left completely exposed for chlorine release when placed in said water so that the surface area of said tablet exposed for chlorine release in said water remains constant for substantially the entire life of said tablet.

3,856,933

PYROTECHNIC DISSEMINATING SYSTEM

Erwin M. Jankowiak, Sanford; Earl Thomas Niles, and George A. Lane, both of Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 709,916, March 4, 1968, abandoned. This application Sept. 8, 1970, Ser. No. 70,493
Int. Cl. C06d *3/00*
U.S. Cl. 424—42 7 Claims

1. A pyrotechnic disseminating formulation comprising on a weight basis:

a. from about 15 to about 35 per cent of an oxidizing agent selected from the group consisting of an alkali metal or ammonium nitrate, chlorate, perchlorate and mixtures thereof,

b. from about 12 to about 25 per cent of a non-halogenated polyepoxide resin having a functionality greater than 1 and less than about 3, said polyepoxide resin being selected from the group of the glycidyl ether of bisphenol A, bis[p-(2,3-epoxypropoxy)-phenyl disulfide], glycerine glycidyl ether, 1,2,4-tris (2-(2,3-epoxypropylthio)ethyl) cyclohexane and 3,3'-(ethylenebis(thioethylene)bis(7-oxabicyclo)4.1.0)cycloheptane;

c. from about 0.1 to about 10 per cent of an amine or a dicarboxylic acid or dicarboxylic acid anhydride as curing agent, said curing agent being selected from the group of ethylene diamine, ethylamine, isopropylamine, n-butylamine, isobutylamine, 2-ethylhexylamine, cyclohexylamine, oxalic acid, malonic acid, succinic acid, maleic acid, itaconic acid, succinic anhydride, maleic anhydride, itaconic anhydride and phthalic anhydride;

d. from about 5 to about 20 per cent of a gas generating cooling agent selected from the group consisting of alkali metal acid carbonates, ammonium acid carbonates, guanidine carbonate, oxamide, oxalic dihydrazine and urea oxalate;

e. from about 5 to about 20 per cent of auxiliary fuel, selected from the group consisting of thiourea, tetramethylthiuram disulfide, tetraethylthiuram disulfide, monoaminoguanidinium nitrate, diaminoguanidinium nitrate, triaminoguanidinium, ethylenebis-(aminomonoguanidinium)dinitrate, 1-amino-2,5-hydrazine-triazol nitrate, 1-amino-2,5hydrazine-triazol dinitrate, thiosemicarbazide, ethylenebis(thiosemicarbazide), thiocarboxyhydrazide, aminonitroquanidine and dithiobiurea; and

f. the balance of an insecticide selected from the group of 0,0-diethyl-0,3,5,6-trichloro-2-pyridyl phosphorothioate and 0,0-dimethyl-0[2,4,5-trichlorophenyl] phosphorothioate.

3,856,934

SKIN DEPIGMENTATION

Albert Montgomery Kligman, 1940 Lombard St., Philadelphia, Pa. 19146

Continuation-in-part of Ser. No. 49,523, June 24, 1970, abandoned. This application Jan. 22, 1973, Ser. No. 325,687
Int. Cl. A61k *7/12*
U.S. Cl. 424—62 8 Claims

1. A skin depigmenting composition for topical appplication to the skin comprising a melanin inhibiting amount of hydroquinone, retinoic acid and a corticosteroid.

3,856,935

ORAL TYPHOID VACCINE AND METHOD OF PREPARING THE SAME

Rene Germanier, Muri, Switzerland, assignor to Schweizerisches Serum-und Impfinstitut und Institut Zug Erforschung der Infektionskrankheiten, Bern, Switzerland

Continuation of Ser. No. 169,076, Aug. 4, 1971,. This application Feb. 12, 1973, Ser. No. 331,847
Claims priority, application Switzerland, Apr. 29, 1971, 6319/71
Int. Cl. A61k *23/00*
U.S. Cl. 424—92 8 Claims

1. A method of producing an oral typhoid vaccine free from tendencies to reversion to virulence which comprises:

a. exposing a virulent strain of Salmonella typhi to a mutagenic agent until deletion mutants defective in the enzyme uridine diphosphogalactose-4-epimerase are formed;

b. infecting the exposed strain with a smooth-specific bacteriophage until the smooth bacteria present undergo lysis while rough bacteria survive because their rough structure does not provide receptors for said bacteripohage;

c. separating formed rough mutants identifiable by the sharply reduced galactokinase activity and galactose-1-phosphate uridylyl transferase activity thereof as compared to said virulent strain from other surviving rough mutants;

d. cultuting the separated mutants;

e. harvesting the cells of the cultured mutants;

f. suspending the harvested cells in a protective liquid medium consisting essentially of a dispersion of solid carrier material in a volatile liquid to form a suspension; and

g. volatilizing said liquid from the solids in said suspension, 1. the amount of said harvested cells being sufficient to improve the resistance of a person to infection with Salmonella typhi after oral ingestion of said solids by said person.

3,856,936

COMPOSITION AND METHOD FOR CORTISOL CONTROL

James A. Vick, and Charles S. Castner, both of Reading, Pa., assignors to Schuyler Development Corporation, Reading, Pa.

Filed May 7, 1973, Ser. No. 357,670
Int. Cl. A61k *17/00*
U.S. Cl. 424—98 8 Claims

1. A composition for cortisol level control in mammals by topical application consisting essentially of an effective amount of a member selected from the group consisting of whole bee venom and mellitin in a mixture of cocoa butter fatty acids containing 2 to 50% unreacted cocoa butter produced by partial hydrolysis of cocoa butter.

3,856,937

PROCESS FOR ISOLATION OF ANTIBIOTIC AV290

Jack Peter Waite, Fareham, England, assignor to American Cyanamid Company, Stamford, Conn.

Filed Apr. 27, 1973, Ser. No. 355,240
Int. Cl. A61k *21/00*
U.S. Cl. 424—115 5 Claims

1. A process of recovering an antibiotic AV290-alkyl sulfate complex from a fermentation whole harvest mash containing antibiotic AV290 which comprises the steps of:

a. producing a fermentation liquor by filtering the whole harvest mash;

b. acidifying the fermentation liquor to a pH of from 1.9 to 2.1 with a pharmacologically acceptable acid;

c. adding to the acidified liquor a complexing agent selected from the group consisting of compounds of the formula: $CH_3-(CH_2)_n-O-SO_2-OM$

wherein *n* is an integer from 9 to 17, inclusive, and M is sodium or potassium, and mixtures thereof until a suffi-

cient amount of the antibiotic AV290-alkyl sulfate complex is imparted to said medium;
d. removing the precipitated antibiotic AV290-alkyl sulfate complex; and
e. drying the antibiotic AV290-alkyl sulfate complex.

3,856,938

ANTIBIOTIC EM–49

Sawao Murao, 8-12, 2-Cho Horiage-Midori Machi, Osaka, Japan; Edward Meyers, 4 Plymouth Ln., East Brunswick, N.J. 08816, and William Lawrence Parker, 1410 Oak Tree Dr., Apt. E, North Brunswick, N.J. 08902

Continuation-in-part of Ser. No. 137,894, April 27, 1971, abandoned. This application Apr. 7, 1972, Ser. No. 242,047
Int. Cl. A61k *21/00*

U.S. Cl. 424—116 **10 Claims**

1. A process for producing Antibiotic EM–49 which comprises cultivating *Bacillus circulans* ATCC 21656 in an aqueous nutrient medium comprising an assimilable carbohydrate and an assimilable nitrogen source under submerged aerobic conditions until substantial antibiotic activity is imparted to the medium.

3,856,939

ANTIBIOTIC BL869 BETA AND METHOD OF PREPARATION

George Alfred Ellestad, Pearl River; John Henry Edward James Martin, New City, both of N.Y., and John Norman Porter, Ramsey, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sept. 17, 1973, Ser. No. 398,283
Int. Cl. A61k *21/00*

U.S. Cl. 424—116 **3 Claims**

1. Antibiotic BL869β hydrochloride, a compound which
a. is effective in inhibiting the growth of bacteria; and in its essentially pure crystalline form
b. has an optical rotation $[\alpha]_D^{25}$ =+11.1° (C=0.351 in methanol);
c. has the following elemental analysis (percent): C, 40.94; H, 5.42; N, 23.54; O, 11.63; Cl, 16.07;
d. has ultraviolet absorption maxima $\lambda_{max.}^{CH\ OH}$ 235 and 323 mμ ($\gamma_{1\ cm.}^{1\%}$ 350 and 640);
e. has a characteristic infrared absorption spectrum as shown in FIG. **1** of the drawings; and
f. has a characteristic proton magnetic resonance spectrum as shown in FIG. **2** of the drawings.

3,856,940

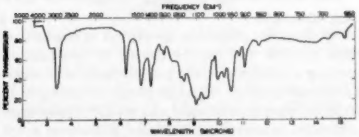
RUMINANT FEED UTILIZATION IMPROVEMENT

Robert L. Hamill, New Ross, and Marvin M. Hoehn, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 211,231, Dec. 23, 1971,. This application Sept. 27, 1972, Ser. No. 292,572
Int. Cl. A61k *21/00*

U.S. Cl. 424—121 **13 Claims**

INFRARED ABSORPTION SPECTRUM OF
ANTIBIOTIC A28695A SALT



1. A method of increasing the digestive efficiency of a ruminant animal having a developed rumen function which comprises the oral administration to said animal of a rumen-affecting amount of an antibiotic selected from the group consisting of
a. A28695A, which is a white crystalline compound melting at 97° to 99°C.; has an approximate molecular weight of 834 as determined by mass spectrometry; has the approximate elemental composition of 63.31% carbon, 8.83% hydrogen, and 28.03% oxygen; which in the form of its sodium salt has one titratable group having a pKa value of 5.51 as determined by electrometric titration in 66% aqueous ethanol; which in the form of its mixed sodium-potassium salt is a white crystalline compound melting at 161°–165°C.; which is insoluble in water, slightly soluble in methanol and is soluble in diethyl ether, ethyl acetate, acetone, chloroform and benzene; has a specific rotation $[\alpha]_D^{25}$ + 14.07° (C=1, methanol); which as a solution in chloroform has the following distinguishable bands in its infrared absorption spectrum: 3.1-3.3, 3.4, 3.47, 6.24, **6.84,** 7.00, 7.25, 7.37, 7.49, 7.68, 7.78, 8.1, 8.47, 8.61, **8.95,** 9.11, 9.20, 9.42, 9.5, 9.80, 9.98, 10.24, 10.54, **10.87,** 11.09, 11.5 and 11.66 microns; and which shows no significant absorption in the ultraviolet region of the spectrum;
b. A28695B, which is a white crystalline compound melting at 122°–124°C.; has an approximate molecular weight of 846 as determined by mass spectrometry; has the approximate elemental composition of 60.49% carbon, 9.15% hydrogen, and 31.32% oxygen; which in the form of its sodium salt has one titratable group having a pKa value of 5.9 as determined by electrometric titration in 66% aqueous ethanol; which in the form of its mixed sodium-potassium salt is a white crystalline compound melting at 170–172°C.; which salt is insoluble in water, slightly soluble in methanol, soluble in diethyl ether, ethyl acetate, acetone, chloroform and benzene; has a specific rotation $[\alpha]_D^{25}$ + 10.1° (C=1, 95% aqueous ethanol); which as a solution in chloroform has the following distinguishable bands in its infrared spectrum: 3.0, 3.4, 3.47, **6.24,** 6.85, 7.01, 7.26, 7.3, 7.68, 7.78, 8.1, 8.58, 8.82, **8.95,** 9.11, 9.19, 9.45, 9.59, 9.82, 10.04, 10.28, 10.55, **11.10,** 11.24 and 11.65 microns; and which has no significant absorption in the ultraviolet region of the spectrum; and
c. the physiologically-acceptable salts thereof.

3,856,941

ASTRINGENT GEL, ITS PREPARATION AND USE

Robert A. Turner, Greenwich, Conn., assignor to Jack Sobel, Patchoque, N.Y.

Filed May 23, 1972, Ser. No. 256,039
Int. Cl. A61k *7/00, 27/00*

U.S. Cl. 424—145 **13 Claims**

1. In a process of preparing an astringent gel, the steps which consist essentially of
a. preparing an aqueous solution of a mixture of an astringent aluminum salt and at least one other astringent metal salt selected from the group consisting of zinc salts, zirconium salts, and magnesium salts, the concentration of said mixture of astringent salts in said solution exceeding 18%,
b. dissolving therein a gelling agent selected from the group consisting of polyvinyl alcohol having a molecular weight between about 10,000 and 96,000 and up to 13% acetyl groups and methyl cellulose having a molecular weight between about 13,000 and 26,000 and a degree of substitution between about 1.3 and 2.6 in an amount insufficient to form a gel in said concentrated salt solution but sufficient to yield a gel when the resulting sol of the mixture of astringent metal salts and gelling agent is diluted with water to a metal salt concentration below 18%,
c. adjusting the pH of the solution obtained in step (a) or step (b) to a value which does not have an irritating effect on human skin but which is below the level at which hydroxides of the astringent metals precipitate,

d. adding to said sol an amount of water sufficient to reduce the astringent metal salt concentration in said sol to a concentration lower than 18% but not substantially below 13% and

e. allowing the diluted sol to stand to form the astringent gel.

3,856,942

APPETITE CONTROL COMPOSITION

Paul L. Murphy, 831 Massachusetts Ave., Cambridge, Mass. 02139

Filed May 10, 1973, Ser. No. 359,056

Int. Cl. A01n *9/00, 9/28*

U.S. Cl. 424—180 **28 Claims**

1. An appetite control composition for oral administration to a human subject to aid him in controlling his weight, comprising, in combination, a carbohydrate in an amount to obtain the effect of carbohydrate on hunger, and a nontoxic local anesthetic and an alkaloid stimulant in amounts to control the appetite.

3,856,943

COMPOSITIONS AND PROCESS

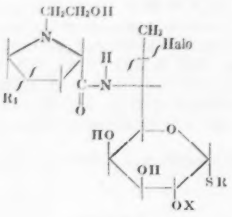
Robert D. Birkenmeyer, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 156,099, June 23, 1971, Pat. No. 3,787,390. This application Dec. 17, 1973, Ser. No. 425,148

Int. Cl. A01n *9/00*

U.S. Cl. 424—180 **10 Claims**

1. A pharmaceutical composition comprising a compound of the formula:



or the acid addition salts thereof wherein Halo is chlorine, bromine, or iodine, X is a member selected from the group consisting of hydrogen, an acyl of an aliphatic carboxylic acid having from 2 to 18 carbon atoms, inclusive,

the zwitterion thereof or the hemi salt thereof; R is alkyl of not more than 4 carbon atoms wherein R_1 is alkyl of not more than 8 carbon atoms in association with a pharmaceutical carrier.

3,856,944

PHARMACEUTICAL COMPOSITIONS

Daisuke Satoh, Nishinomiya, Japan, assignor to Shionogi & Co., Ltd., Osaka, Japan

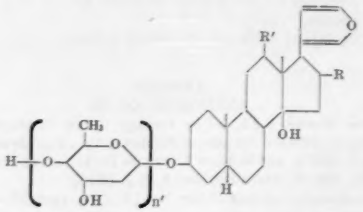
Division of Ser. No. 18,337, March 10, 1970, Pat. No. 3,745,156. This application Nov. 10, 1972, Ser. No. 305,554

Claims priority, application Japan, Mar. 19, 1969, 44-20994

Int. Cl. A61k *27/14*

U.S. Cl. 424—182 **5 Claims**

1. A process for the treatment of human, poultry or veterinary heart diseases which comprises the administration of a medicament comprising a pharmaceutically effective amount of a cardiotonic compound of following formula



wherein at least one of R and R' is a hydroxy, and the remaining if any is a hydrogen, and *n' is an integer of* 1 or 2, or a lower alkanoate thereof, in combination with a pharmaceutical carrier.

3,856,945

METHOD OF REDUCING SERUM CHOLESTEROL LEVEL WITH EXTRACT OF KONJAC MANNAN

Noboru Sugiyama, Tokyo, and Hideo Shimahara, Mihara, both of Japan, assignors to Kabushiki Kaisha Shimizu Manzo Shoten, Hiroshima-ken, Japan

Filed Sept. 9, 1971, Ser. No. 179,201

Claims priority, application Japan, Dec. 30, 1970, 45-12828

Int. Cl. A61k *27/14*

U.S. Cl. 424—195 **1 Claim**

1. A method for reducing the serum cholesterol levels in hypercholesteremic warm-blooded animals which comprises orally administering a therapeutically effective dose of substantially pure, water-soluble konjac mannan in the range of 0.1–10 g. per kg of animal body weight per day, said konjac mannan being obtained by extracting with water the ground tuber of the konjac plant, dialyzing such extract against water and lyophilizing the thus dialyzed extract to remove water.

3,856,946

PRUNUS AFRICANA EXTRACT

Jacques Debat, Paris, France, assignor to Laboratoires du Dr. Debat, Paris, France

Continuation of Ser. No. 66,631, Aug. 24, 1970, abandoned, which is a continuation-in-part of Ser. No. 643,347, June 5, 1967, abandoned. This application Mar. 8, 1973, Ser. No. 339,205

Claims priority, application Great Britain, June 10, 1966, 25893/66

Int. Cl. A61k *27/00*

U.S. Cl. 424—195 **8 Claims**

1. A process for preparing an extract of the bark of *Prunus africana* suitable for the treatment of prostatic adenoma, comprising contacting finely ground bark of *Prunus africana* with a solvent selected from the group consisting of methanol, an 80:20 mixture of methanol and water, chloroform, methylene chloride, benzene, cyclohexane, petroleum ether, diethyl ether, acetone, methylethylketone and mixtures thereof, said solvent being present in a proportion represented by 1 Kg of finely ground bark to at least 2 litres of solvent; separating the resulting solution of bark solubles from the finely ground bark and evaporating the solvent to yield said solubles.

3,856,947
INSECTICIDAL COMPOSITIONS AND METHODS OF KILLING INSECTS USING A MIXTURE OF CYTROLANE AND CHLORPHENAMIDINE

Menashe Hadomi, Tel-Aviv, Israel, assignor to C.T.S. Chemicals & Technical Supplies Ltd., Tel-Aviv, Israel

Filed Sept. 15, 1971, Ser. No. 180,881
Claims priority, application Israel, Sept. 24, 1970, 35342
Int. Cl. A01n *9/02, 9/12, 9/22*
U.S. Cl. 424—202 **5 Claims**

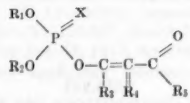
1. A synergistic insecticidal composition comprising N,N-dimethyl-N'-(2-methyl-4-chlorophenyl)-formamidine and 2-(diethoxyphosphinylimino)-4-methyl-1,3-dithiolane in a ratio of 1:2 to 1:10, respectively.

3,856,948
INSECTICIDAL PHOSPHORIC ACID ESTERS

Odd Kristiansen, and Kurt Gubler, both of Riehen/BS, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 69,893, Sept. 4, 1970, Pat. No. 3,733,376.
This application Apr. 11, 1973, Ser. No. 350,293
Claims priority, application Switzerland, Sept. 10, 1969, 13751/69
Int. Cl. A01n *9/36*
U.S. Cl. 424—212 **14 Claims**

1. An insecticidal composition which comprises, as the insecticidally active ingredient an insecticidally effective amount of a compound of the formula



[(I)]

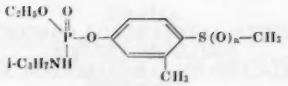
wherein
X represents oxygen or sulphur,
R_1 and R_2 each independently represents lower alkyl,
R_3 represents hydrogen, lower alkoxycarbonyl or trifluoromethyl, and when
R_4 represents lower alkoxy, lower alkylthio or di-loweralkylamino,
R_5 represents lower alkoxy
or when
R_4 represents lower alkylthio,
R_5 represents di-lower-alkylamino in admixture with a dispersing agent.

3,856,949
N-ISOPROPYL-O-ETHYL-O-ARYLPHOSPHORIC ACID ESTER AMIDES AS ARTHROPODICIDES AND NEMATOCIDES

Gerhard Schrader, Kohlfurter Strasse 75, Wuppertal-Cronenberg, and Bernhard Homeyer, both of c/o Farbenfabriken Bayer AG, Leverkusen, both of Germany

Division of Ser. No. 47,137, June 17, 1970, Pat. No. 3,709,961.
This application Oct. 13, 1972, Ser. No. 297,522
Int. Cl. A01n *9/36*
U.S. Cl. 424—216 **6 Claims**

1. A nematocidal, acaricidal or insecticidal composition comprising a nematocidally, acaricidally or insecticidally effective amount of an N-isopropyl-O-ethyl-O-phenylphosphoric acid ester amide of the formula



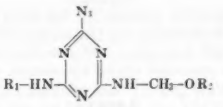
in which
n is 1 or 2,
in admixture with a diluent.

3,856,950
METHOD OF COMBATING INSECTS

Alexis Herzog, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 252,784, May 12, 1972, abandoned. This application Feb. 11, 1974, Ser. No. 441,613
Claims priority, application Switzerland, June 1, 1971, 7926/71; Apr. 10, 1972, 5215/72
Int. Cl. A01n *9/22*
U.S. Cl. 424—226 **6 Claims**

1. A method of combatting insects selected from the group consisting of Coleoptera and Diptera which comprises applying to said insects in their larval state a metamorphosis-inhibiting amount of an s-triazine derivative of the formula



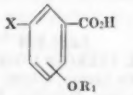
wherein R_1 and R_2 represent lower alkyl having from one to five carbon atoms.

3,856,951
SUBSTITUTED BENZOIC ACID HYPOLIPHEMIC AGENTS

Gerald Fagan Holland, c/o Pfizer Inc., 235 E. 42nd St., New York, N.Y. 10017

Division of Ser. No. 155,209, June 21, 1971,. This application Nov. 7, 1972, Ser. No. 304,528
Int. Cl. A61k *27/00*
U.S. Cl. 424—230 **9 Claims**

1. A method for reducing blood lipid levels which comprises administering to a hyperlipemic mammal a hypoliphemic effective amount of a compound selected from those of the formula



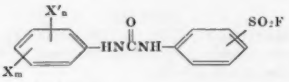
and the pharmaceutically acceptable salts thereof wherein
X is selected from the group consisting of fluorine, chlorine, bromine, methyl, methoxy and trifluoromethyl and
R_1 is selected from the group consisting of methyl, benzyl and substituted benzyl wherein said substituent is selected from the group consisting of fluorine, chlorine, methyl, methoxy, trifluoromethyl and 3,4-dimethoxy.

3,856,952
SYNERGISTIC ANTIMICROBIAL COMPOSITIONS EMPLOYING CERTAIN N-(PHENYL-CARBAMYL)AMINO-BENZENE SULFONYL FLOURIDES

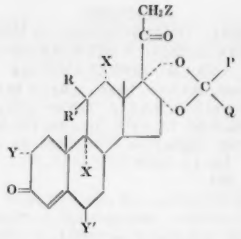
Ludwig Konrad Huber, King of Prussia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Mar. 1, 1973, Ser. No. 337,047
Int. Cl. A01n 9/02
U.S. Cl. 424—233 7 Claims

1. An antibacterial and antifungal composition consisting essentially of an effective amount of a mixture of (A) an N-(phenyl-carbamyl) amino-benzene sulfonyl fluoride of the formula



where X is chlorine, bromine, trifluoromethyl, methoxy or fluorosulfonyl; X′ is hydrogen, chlorine, bromine, trifluoromethyl, methoxy or fluorosulfonyl; *m* is a whole number from 1 to 3, and *n* is a whole number from 1 to 3, with (B) a compound selected from the group consisting of 3,4′, 5-tribromosalicylanilide, 3,4,4′-trichlorocarbanilide, hexachlorophene, and 2,4,4′-trichloro-2′-hydroxydiphenyl ether, there being in the mixture 15 to 85% by weight of component (A) and, from 85 to 15% by weight of component (B).



and the 1,2-dehydro and 6,7-dehydro derivatives thereof, wherein R is hydrogen, R¹ is β-hydroxy, and together R and R¹ is keto; X is hydrogen, halogen or lower alkyl, at least one X being hydrogen; Y and Y′ each is hydrogen or methyl; Z is halogen, hydroxy or acyloxy; P is hydrogen, lower alkyl, halo-lower alkyl, carboxy-lower alkyl, monocyclic cycloalkyl, monocyclic aryl, monocyclic aryl-lower alkyl, monocyclic heterocyclic or monocyclic heterocyclic-lower alkyl; Q is lower alkyl, halo-lower alkyl, carboxy-lower alkyl, monocyclic cycloalkyl, monocyclic aryl, monocyclic aryl-lower alkyl, monocyclic heterocyclic or monocyclic heterocyclic-lower alkyl; and together with the carbon to which they are joined P and Q are cycloalkyl or monocyclic heterocyclic, about 0.5 to 2% of a carboxymethylene hydrocolloid polymer of acrylic acid cross linked with polyallyl sucrose, about 10 to 20% of propylene glycol, about 10 to 20% of isopropyl alcohol or ethyl alcohol and about 0.01 to 0.15% of alkali metal bisulfite.

3,856,953
METHOD OF TREATING FATTY LIVER

William H. Saltzman, New Rochelle, N.Y., assignor to Intellectual Property Development Corporation, New Rochelle, N.Y.

Filed May 15, 1973, Ser. No. 360,572
Int. Cl. A61k 17/00
U.S. Cl. 424—238 3 Claims

1. A method for therapeutic treatment of a patient with fatty liver, which comprises;

a. orally administering to a patient suffering from a fatty liver;

b. a small but effective amount of a compound selected from the group consisting of, 3α,7α,12α-trihydroxy-5β-cholanic acid; 3α,7α-dihydroxy-12α-acyloxy-5β-cholanic acid; 3α,7α,12α-triacyloxy-5β-cholanic acid; 3α-hydroxy-7α,12α-diacyloxy-5β-cholanic acid; and the non-toxic, pharmaceutically acceptable salts thereof; wherein the acyloxy moiety is from a hydrocarbon carboxylic acid of less than 12 carbon atoms.

3,856,954
TOPICAL STEROID COMPOSITIONS

Ivan Jackson, St. John Forbes, Wirral, England, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Nov. 8, 1972, Ser. No. 304,690
Claims priority, application Great Britain, Jan. 10, 1972, 1080/72
Int. Cl. A61k 17/06
U.S. Cl. 424—241 7 Claims

1. A gel composition comprising, by weight, about 0.01 to 1% of a topical steroid selected from the group having the formula

---

3,856,955
METHOD AND COMPOSITIONS FOR PREVENTING RETENTION OF PLACENTA FOLLOWING INDUCED PARTURITION IN CATTLE

Donal C. Anderson, Whakatane, New Zealand, assignor to Ciba-Geigy Corporation, Greenburgh, N.Y.

Continuation of Ser. No. 242,815, April 10, 1972, Pat. No. 3,775,539. This application July 24, 1973, Ser. No. 382,246
Int. Cl. A61k 17/00
U.S. Cl. 424—243 4 Claims

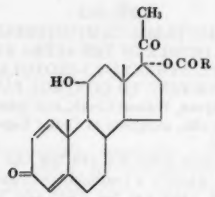
1. A method of preventing retention of placenta following induced parturition in cows which comprises parenterally administering to cows, pregnant for at least about 220 days, 10 to 60 mg. of a long-lasting parturition-inducing 21-esterified glucocorticoid with parturition taking place after a latent period of at least about seven days.

3,856,956
17-ACYLOXYSTEROIDS AND THEIR MANUFACTURE

Peter Oxley, and John Rosindale Housley, both of Nottingham, England, assignors to Boots Pure Drug Company Limited, Nottingham, England

Division of Ser. No. 613,454, Feb. 2, 1967, Pat. No. 3,639,434. This application Jan. 28, 1972, Ser. No. 221,812
Int. Cl. A61k 17/00
U.S. Cl. 424—243 8 Claims

1. A therapeutic composition in a form suitable for topical administration which comprises an anti-inflammatory effective amount of a compound of the formula



in which R is a member selected from the group consisting of ethyl, n-propyl and isopropyl, in association with a pharmaceutically acceptable carrier.

3,856,957

METHODS AND COMPOSITIONS FOR TREATING BACTERIAL INFECTIONS EMPLOYING IMINES

Florin Seng; Kurt Ley, and Karl Georg Metzger, all of Farbenfabriken Bayer AG, Leverkusen, Germany

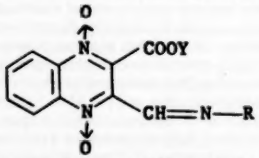
Division of Ser. No. 130,007, March 31, 1971,. This application Jan. 15, 1973, Ser. No. 323,953

Claims priority, application Germany, Apr. 2, 1970, 2015676

Int. Cl. A61k *27/00*

U.S. Cl. 424—246 38 Claims

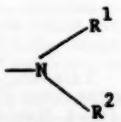
1. An antibacterial composition which comprises an antibacterially effective amount of a compound of the formula



or a pharmaceutically acceptable non-toxic salt thereof wherein

Y is hydrogen, an alkali metal cation or the cation $R^5-\overset{\oplus}{N}H_3$; and

each of R and R^5 is



in which

each of R^1 and R^2 when taken independently is identical to or different from the other, and is selected from the group consisting of hydrogen, alkyl of one to four carbon atoms and hydroxyalkyl of one to four carbon atoms, or

R^1 and R^2 together with the nitrogen atom to which they are attached form a 6-membered heterocyclic ring wherein the nitrogen atom is the only heteroatom or wherein oxygen or SO_2 is also present as a ring member

in combination with a pharmaceutically acceptable non-toxic inert diluent or carrier.

3,856,958

1-(5-PHENYL-4-OXO-2-OXAZOLIN-2-YL)-4-CINNAMOYLPIPERAZINES IN THE TREATMENT OF DEPRESSION

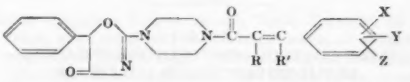
Cheuk Man Lee, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 368,377, June 8, 1973, abandoned, which is a division of Ser. No. 258,144, May 31, 1972, Pat. No. 3,784,545. This application Dec. 17, 1973, Ser. No. 425,394

Int. Cl. A61k *27/00*

U.S. Cl. 424—250 3 Claims

1. A method of treating a patient exhibiting symptoms of depression comprising the step of administering to said patient at least an effective dosage of the compound of the formula



wherein R is hydrogen or a loweralkyl of one to six carbon atoms; R′ is hydrogen, halogen or a loweralkyl of one to six carbon atoms and X, Y and Z each are hydrogen, halogen or a loweralkoxy selected from the group consisting of methoxy, ethoxy, propoxy or butoxy.

3,856,959

INHIBITION OF LEUKEMIA UTILIZING 5-METHYLTETRAHYDROHOMOFOLATE

John A. R. Mead, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed July 24, 1972, Ser. No. 274,749

Int. Cl. A61k *27/00*

U.S. Cl. 424—251 3 Claims

1. A method of inhibiting L1210 leukemia in mice which consists of injecting in said mice an effective inhibition dosage of 5-methyltetrahydrohomofolate.

3,856,960

METHOD OF INHIBITING INFLAMMATION USING 1,4-ISUBSTITUTED-METHYLENEDIOXY-2(1H)-QUINAZOLINONES AND QUINAZOLINTHIONES

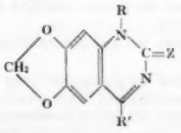
George A. Cooke, Denville, and William J. Houlihan, Mountain Lakes, both of N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

Division of Ser. No. 141,010, May 6, 1971, Pat. No. 3,748,331, which is a continuation-in-part of Ser. No. 34,902, May 5, 1970, abandoned, which is a continuation-in-part of Ser. No. 881,325, Dec. 1, 1969, abandoned. This application Apr. 13, 1973, Ser. No. 351,093

Int. Cl. A61k *27/00*

U.S. Cl. 424—251 2 Claims

1. The method of inhibiting inflammation in animals comprising administering a pharmacologically effective amount of a compound of the formula

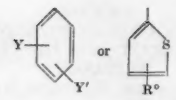


wherein

Z is oxygen or sulfur

R is lower alkyl, cyclo(lower)alkyl, or cyclo(lower) alkyl(-lower)straight chain alkyl

R′ is



Y is hydrogen, halo of atomic weight of from 19 to 36, lower alkyl, lower alkoxy, nitro or trifluoromethyl;
Y′ is hydrogen, halo of atomic weight of from 19 to 36, lower alkyl, lower alkoxy, nitro or trifluoromethyl;
Y′ is hydrogen, halo of atomic weight of from 19 to 36, lower alkyl or lower alkoxy; or
Y and Y″ together from methylenedioxy; and
R° is hydrogen, halo of atomic weight of from 19 to 36 or lower alkyl.

3,856,961

SLIME CONTROL COMPOSITION CONTAINING BROMONITROSTYRENE AND ITS USE

Robert H. Brink, Jr., Doylestown; Bernard F. Shema, Glenside, and Paul Swered, Philadelphia, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 464, Jan. 2, 1970, abandoned. This application Aug. 11, 1972, Ser. No. 280,014
Int. Cl. A01n *9/22*
U.S. Cl. 424—263 **9 Claims**

1. A method for controlling the growth of the microorganism Aerobacter Aerogenes in an aqueous system in which said microorganism is found which comprises adding to the said system so as to contact said microorganism an effective amount of a combination comprising B-bromo-B-nitrostyrene and lauryl pyridinium chloride, where the weight ratio of the styrene to the chloride is from 95 to 5 percent to about 50 to 50 percent.

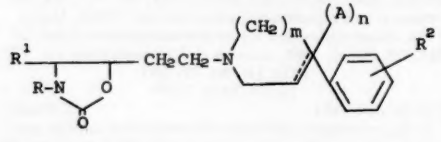
3,856,962

ANTI-INFLAMMATORY AGENTS

Reevis S. Alphin, 815 Westham Pky., Richmond, Va. 23229, and David A. Droppleman, 2331 Clarke St., Richmond, Va. 23228

Continuation-in-part of Ser. No. 377,895, July 10, 1973, abandoned. This application Apr. 24, 1974, Ser. No. 463,624
Int. Cl. A61k *27/00*
U.S. Cl. 424—267 **5 Claims**

1. A process for the amelioration of distress caused by inflammation which comprises administering orally to a warm-blooded animal suffering from inflammation an effective amount of a compound selected from those having the formula:



wherein;
R is selected from the group consisting of hydrogen, lower alkyl and benzyl,
R^1 is selected from the group consisting of hydrogen, and lower alkyl,
R^2 is selected from the group consisting of hydrogen, fluorine, trifluoromethyl and lower alkoxy,
A is selected from the group consisting of hydrogen, hydroxyl, propionyloxy and ethoxycarbonyl,
m is one and two,
n is zero and one and when *n* is zero the dotted line represents a double bond, and
pharmaceutically acceptable acid addition salts thereof.

3,856,963

USE OF INJECTABLE COMPOSITIONS OF THE (+)-OPTIONAL ISOMER OF THE ALPHA RACEMATE OF 2-(2-ETHYL-2-PHENYL-1,3-DIOXOLAN-4-YL) PIPERIDINE TO CONTROL PAIN

Charles R. Thompson, Walnut Creek, and John Hidalgo, Oakland, both of Calif., assignors to Cutter Laboratories, Inc.,, Berkeley, Calif.

Continuation-in-part of Ser. No. 189,760, Oct. 15, 1971, Pat. No. 3,760,077, which is a continuation-in-part of Ser. No. 800,282, Feb. 18, 1969, Pat. No. 3,655,680. This application June 14, 1973, Ser. No. 370,003
Int. Cl. A61k *27/00*
U.S. Cl. 424—267 **8 Claims**

1. A method of relieving pain in humans which comprises administering intravenously or intramuscularly to a human patient in pain, a sterile injectable composition comprising, in admixture with a pharmaceutically acceptable carrier, an amount corresponding to about 0.05 to 0.5 mg/kg., when the administration is intravenous and about 0.1 – 1 mg/kg., when the administration is intramuscular, of the (+) optical isomer of the alpha racemate of 2-(2-ethyl-2-phenyl-1,3-dioxolan-4-yl)-piperidine or a pharmaceutically acceptable acid addition salt thereof, substantially free from its isomers, effective to provide relief from the pain but insufficient to significantly effect voluntary motor activity.

3,856,964

CONCENTRATE FOR INFUSION PURPOSES CONTAINING 5,5-DIPHENYLHYDANTOIN SODIUM

Rainer Brandau, Hamburg, Germany, assignor to Desitin-Werk Carl Klinke GmbH, Alsterkrugchaussee, Hamburg, Germany

Filed Mar. 15, 1973, Ser. No. 341,596
Claims priority, application Germany, Mar. 18, 1972, 2213275; Feb. 24, 1973, 2309263
Int. Cl. A61u *27/00*
U.S. Cl. 424—273 **8 Claims**

1. Sterilizable infusion concentrate of essentially unlimited stability, which contains 5,5-diphenyl hydantoin sodium and which is capable of dilution with aqueous infusion solution in any ratio and which comprises as solvents either (1) water, (2) 10 to 50 percent (weight/volume) of tetrahydrofurfuryl alcohol polyethylene glycol ether and (3) 35 to 5 percent (weight-/volume) of 2-amino-2-(hydroxymethyl)-propane-1,3-diol as a solubilizer for the 5,5-diphenyl sodium or (1) water, (2) 20 to 50 percent (weight/volume) of propylene glycol and (3) 10 to 2 percent (weight/volume) of 2-amino-2-(hydroxymethyl)-propane-1,3-diol as a solubilizer for the 5,5-diphenyl hydantoin sodium.

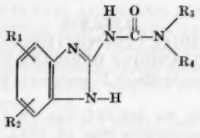
3,856,965

METHOD FOR TREATING HYPERTENSION

Boyd E. Graham, and Louis L. Skaletzky, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed May 17, 1973, Ser. No. 361,278
Int. Cl. A61k *27/00*
U.S. Cl. 424—273 **14 Claims**

1. A method of treating hypertension in mammals which comprises administering to hypertensive mammals an effective amount for reducing hypertension of a compound selected from the group consisting of compounds of the formula:



and the pharmaceutically acceptable acid addition salts thereof wherein R_1 and R_2 are each selected from hydrogen, halogen, lower-alkyl, lower alkoxy, and trifluoromethyl provided that when R_1 is hydrogen R_2 is selected from halogen, lower alkyl, lower alkoxy and trifluromethyl; R_3 and R_4 are each selected from hydrogen and lower alkyl.

3,856,966

TREATMENT OF VIRAL INFLUENZA INFECTIONS

James B. Mercer, 13109 W. 95th St., Shawnee Mission, Kans. 66215

Filed June 18, 1973, Ser. No. 370,952
Int. Cl. A61k *27/00*
U.S. Cl. 424—273 **3 Claims**

1. A method for the treatment of viral influenza infections in a human host, comprising: administering orally an anti-viral influenza infection effective amount of 1-(β-hydroxyethyl)-2-methyl-5-nitromidazole to a human host in need of said treatment.

3,856,967

NOVEL INDOLES IN THE TREATMENT OF PAIN

Andre Allais, Les Lilas, and Gerard Nomine, Noisy Le Sec, both of France, assignors to Roussel Uclaf, Paris, France

Division of Ser. No. 72,859, Sept. 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 813,709, April 4, 1969, abandoned, which is a continuation-in-part of Ser. No. 790,151, Jan. 9, 1969, abandoned. This application July 17, 1972, Ser. No. 272,375

Claims priority, application France, Jan. 11, 1968, 68.135641; Sept. 17, 1969, 69.31578; Dec. 10, 1968, 68.177430; Apr. 10, 1968, 68.147662; Sept. 10, 1968, 68.165689; Sept. 11, 1968, 68.165812; Dec. 10, 1968, 68.177431

Int. Cl. A61k *27/00*
U.S. Cl. 424—274 **6 Claims**

1. A method of treating pain in humans which comprises administering to humans a safe and analgesically effective amount of a compound selected from the group consisting of (a) 1-(carboxymethyl)-2-methyl-3-p-chlorobenzyl-6-methoxy-indole, (b) 1-(carboxymethyl)-2-methyl-3-p-methoxy-benzoyl-6-methoxy-indole, (c) 1-(carboxymethoxy)-2-methyl-3-p-fluorobenzoyl-6-methoxy-indole, (d) 1-(α-carboxyethyl)-2-methyl-3-p-chlorobenzoyl-6-chloro-indole or (e) 1-(α-carboxy-ethyl)-2-methyl-3-p-fluorobenzoyl-6-chloro-indole and a lower alkyl ester thereof and salt thereof with a non-toxic, therapeutically acceptable base.

3,856,968

CARBAMATES AND THEIR USE AS PESTICIDES

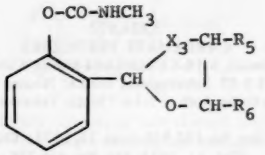
Erwin Nikles, Allschwil; Volker Dittrich, and Ladislaus Pinter, both of Basel, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 758,616, Sept. 9, 1968, abandoned, which is a continuation-in-part of Ser. No. 647,274, April 28, 1967, abandoned, which is a division of Ser. No. 493,256, Oct. 5, 1965, abandoned. This application Nov. 15, 1971, Ser. No. 199,008

Claims priority, application Switzerland, Oct. 8, 1964, 13113/64

Int. Cl. A01n *9/00, 9/12, 9/20*
U.S. Cl. 424—276 **12 Claims**

1. A preparation for combatting insects comprising (1) as active ingredient an insecticidally effective amount of an o-phenyl carbamate compound of the formula



wherein each of R_5 and R_6 is hydrogen or lower alkyl and X_3 is oxygen or sulfur, and (2) a suitable carrier.

3,856,969

KASUGAMYCIN AS A PLANT DISEASE PREVENTIVE AGENT

Hamao Umezawa; Yoshiro Okami; Tomio Takeuchi, all of Tokyo, and Tetsuji Ishiyama, Kanagawa-ken, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyukai (Microbial Chemistry Research Foundation), Tokyo, Japan

Filed Mar. 3, 1965, Ser. No. 436,846

Claims priority, application Japan, June 23, 1964, 39-35307; June 26, 1964, 39-36028

Int. Cl. A61k *21/00*
U.S. Cl. 424—283 **4 Claims**

1. A rice blast disease preventive composition comprising an effective amount for preventing rice blast disease of kasugamycin or its addition acid salts, and a carrier.

3,856,970

Patent Not Issued For This Number

3,856,971

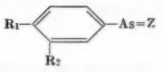
METHOD OF COMBATING FILARIASIS IN DOGS

Ernst A. H. Friedheim, 5, Ave. Marc Monnier, Geneva, Switzerland

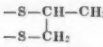
Continuation-in-part of Ser. No. 339,843, March 9, 1973,. This application July 18, 1973, Ser. No. 380,364

Int. Cl. A61k *27/00*
U.S. Cl. 424—297 **10 Claims**

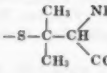
1. A method of combating filariasis due to D. immitis in dogs, comprising orally administering to an infected dog a pharmaceutically effective amount of a compound of the formula I



wherein Z is oxygen or a group of the formula



or Z represents two groups of the formula



R_1 is -OH, -NH.CO.NH_2, -CO.NH_2, -CH_2-CO.NH_2 and R_2 is hydrogen, -NH_2 or -NH.CO.CH_3.

3,856,972
CARBAMATE PESTICIDES

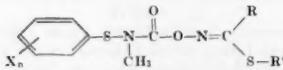
Keimei Fujimoto, 6-18-8 Uozaki-kita-machi, Kobe; Masachika Hirano, 4-9-17 Sakuragaka, Osaka; Hisami Takeda, and Shigehiro Ooba, both of 2-14-7 Mefu, Takarazuka-shi, all of Japan

Division of Ser. No. 182,537, Sept. 21, 1971,. This application Oct. 12, 1973, Ser. No. 405,788

Int. Cl. A01n 9/00

U.S. Cl. 424—298 7 Claims

1. A pesticidal composition comprising an insecticidally, acaricidally or nematocidally effective amount of a carbamate compound of the formula:



wherein X is hydrogen, lower alkyl, lower alkoxy, nitro, chloro, bromo or iodo, R and R′ are each lower alkyl and *n* is an integer of 1 to 3, as the active ingredient, and an inert carrier.

3,856,973
CONTROL OF ACARINAE WITH CARBAMATES HAVING AN OXIME ETHER FUNCTION

Adolf Hubele, Riehen near Basel, Switzerland, assignor to Ciba-Geigy, Limited A. G., Basel, Switzerland

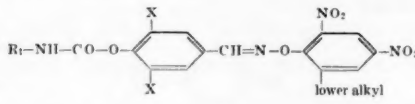
Division of Ser. No. 195,822, Nov. 4, 1971, Pat. No. 3,772,385, which is a continuation-in-part of Ser. No. 786,762, Dec. 24, 1968, abandoned. This application Aug. 24, 1973, Ser. No. 391,442

Claims priority, application Switzerland, Jan. 5, 1968, 121/68

Int. Cl. A01n 9/20

U.S. Cl. 424—300 3 Claims

1. A method for combating pests of the order acarinae comprising applying to sites infested with such pests an acaricidally effective amount of a compound of the formula



wherein R_1 is lower alkyl with one to four carbon atoms which is unsubstituted or substituted by a chlorine atom, phenyl which is unsubstituted or mono to trisubstituted by members selected from the group consisting of halogen, methyl, methoxy, trifluoromethyl and nitro, or R_1 is benzyl, phenylethyl or cyclohexyl; and X represents chlorine, bromine or iodine.

3,856,974
FUNGICIDAL USE OF 3,4-DIBROMOBUTYRONITRILE

Jacques Perronnet, and Pierre Girault, both of Paris, France, assignors to Roussel Uclaf, Paris, France

Filed Oct. 10, 1973, Ser. No. 404,932

Claims priority, application France, Oct. 26, 1972, 72.37977

Int. Cl. A01n 9/06, 9/20

U.S. Cl. 424—304 2 Claims

1. A method of killing fungi comprising contacting fungi with a fungicidally effective amount of 3,4-dibromobutyronitrile.

3,856,975
ANTICOCCIDIAL COMPOSITION CONTAINING GUANIDINE DERIVATIVES

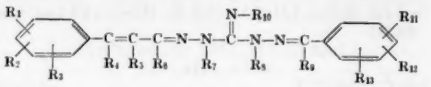
Bruce O. Linn, Somerville, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 200,584, Nov. 19, 1971, Pat. No. 3,816,530. This application Mar. 15, 1974, Ser. No. 451,398

Int. Cl. A61k 27/00

U.S. Cl. 424—304 3 Claims

1. An anticoccidial composition comprising as an active anticoccidial agent a compound having the formula



and acid addition salts thereof, where R_1 and R_{11} are each hydrogen, halogen, nitro, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, acetyl, carbamoyl, cyano, methylsulfinyl, methylsulfonyl, carbomethoxy or dimethylaminosulfonyl; R_2 and R_{12} are each hydrogen, halogen or nitro; and R_3 and R_{13} are each hydrogen or halogen, provided that at least one of said substituents is other than hydrogen; R_4 and R_5 are each hydrogen, halogen or lower alkyl; R_6 through R_9 are each hydrogen or loweralkyl; and R_{10} is hydrogen, lower alkyl or loweralkanoyl, intimately dispersed in a carrier vehicle.

3,856,976
CYCLOPROPANE DERIVATIVE FUNGICIDES

Susan F. Hunter, Wye, near Ashford; Clive B. C. Boyce, Herne Bay; Brian P. Armitage, Sittingbourne; Pieter Ten Haken, Herne Bay, all of England, and Willem M. Wagner, Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.

Division of Ser. No. 246,226, April 21, 1972, abandoned. This application June 18, 1973, Ser. No. 371,214

Claims priority, application Great Britain, Apr. 23, 1971, 011029/71

Int. Cl. A01n 9/24

U.S. Cl. 424—317 3 Claims

1. A method of combatting the fungus *P. oryzae* which comprises contacting said fungus with a fungus inhibiting amount of at least one compound of the formula

wherein each Hal is chlorine or bromine; R_1 is a hydrogen, alkyl of 1–6 carbon atoms or phenyl; R_2 and R_3 each is hydrogen or alkyl of 1–6 carbon atoms; and R_4 is carboxyl; or an alkali metal salt thereof.

3,856,977

FLUORENE-2-ACETIC ACIDS AND DERIVATIVES, COMPOSITION AND METHOD OF USING

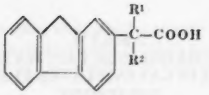
Eric T. Stiller, Sarasota, Fla.; Seymour D. Levine, North Brunswick; Pacifico A. Principe, South River, and Patrick A. Diassi, Westfield, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 70,913, Sept. 9, 1970,. This application Oct. 16, 1972, Ser. No. 298,102

Int. Cl. A61k *27/00*

U.S. Cl. 424—317 **8 Claims**

1. A method for treating inflammatory conditions in a mammalian host responsive to treatment with anti-inflammatory agents which comprises orally administering to a mammalian host an effective amount of a compound having the structure

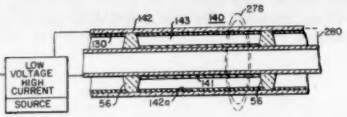


or a physiologically acceptable salt thereof, wherein R^1 is selected from the group consisting of hydrogen, hydroxy, lower alkyl having up to 8 carbon atoms and monocyclic cycloalkyl having from 3 to 6 carbon atoms and R^2 is selected from the group consisting of hydrogen, alkyl having from 1 to 12 carbon atoms, and monocyclic cycloalkyl having 3 to 6 carbon atoms, provided that at least one of R^1 and R^2 is other than hydrogen.

3,856,978
ADHERENT COATING FOR CAPTIVATING SMALL PARTICLES IN GAS-INSULATED ELECTRICAL EQUIPMENT

Andreas M. Sletten, and Alan H. Cookson, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 21, 1974, Ser. No. 444,589
Int. Cl. H01b *9/04*
U.S. Cl. 174—14 **13 Claims**



1. In gas-insulated electrical equipment, in combination,

a. means defining a pair of spaced metallic electrical members which are at different voltage potentials,

b. an insulating gas disposed in the region interposed between said spaced metallic electrical members for insulation purposes and to prevent voltage breakdown between said electrical members,

c. one or more members associated with said gas-insulated equipment,

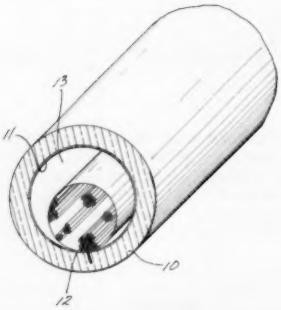
d. means providing a hard coating on the surface of one or more of said members to enable the ready assembly of the electrical equipment,

e. means for rendering the surface of said hard coating subsequently sticky and tacky for causing the adherence thereto of minute contaminating particles and thereby effecting the trapping or captivation of said minute contaminating particles.

3,856,979
SEMICONDUCTING COATING FOR ELECTRICAL GLASS CONDUITS

Anthony P. Schmid, Riga, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 14, 1973, Ser. No. 415,737
Int. Cl. H01b *7/34, 9/06*
U.S. Cl. 174—15 C **2 Claims**

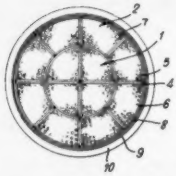


1. In a tubular glass conduit loosely containing and electrically insulating an electrical power conductor capable of transmitting power in excess of **50** megawatts, wherein said conductor is supported by the internal surface of said conduit and the residual free volume in said conduit not occupied by the electrical conductor contains a heat transfer fluid, the improvement wherein said internal surface of said conduit is provided with a thin, tenaciously adhering, abrasion resistant, semiconductive coating from the group consisting of tin oxide or titanium oxide, said coating having a surface resistivity in the range of about 300 to about 1,500 ohms per square.

3,856,980
TELECOMMUNICATION CABLES

Robert Tadeusz Puckowski; John Michael Richards Hagger, and Keith Robert McMillan Elder, all of London, England, assignors to British Insulated Callender's Cables Limited, London, England

Filed Nov. 27, 1970, Ser. No. 92,992
Claims priority, application Great Britain, Nov. 28, 1969, 58358/69
Int. Cl. H01b *7/02*
U.S. Cl. 174—23 C **10 Claims**



1. As an article of manufacture, a telecommunication cable comprising a multiplicity of conductors each at least in part insulated with plastics material having an anti-oxidant therein and a water-proof sheath, the interstices between the insulated conductors and between the conductors and the water-proof sheath being filled with a water-impermeable medium which will not drain under the influence of gravity or such hydrostatic pressure as may arise in the event of damage to the cable sheath but which will permit relative sliding movement of the insulated conductors over one another during such bending of the cable as occurs during manufacture and installation of the cable and which comprises, as an essential ingredient, at least one synthetic polymeric material synthesised from petroleum products and, as another ingredient, at least one of a hydrocarbon wax, a hydrocarbon oil and a mixture of a hydrocarbon wax and oil, wherein sufficient of at least one anti-oxidant is incorporated in the water-impermeable medium that, while the cable is in service and anti-oxidant from the plastics insulation of the conductors is tending to permeate into the water-impermeable medium, the anti-oxidant incorporated in said water-impermeable medium will tend to permeate into the plastics insulation of the conductors thereby substantially to compensate for loss of anti-oxidant from the conductor insulation into the water-impermeable medium.

3,856,981
POWER PANEL ARRANGEMENT

Bruce K. Boundy, Holland, Mich., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

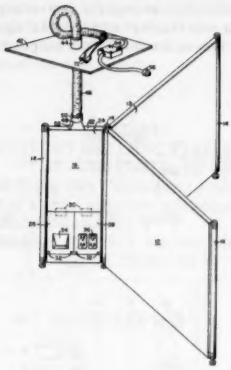
Filed Aug. 28, 1973, Ser. No. 392,131
Int. Cl. H02g *3/00*
U.S. Cl. 174—48 **12 Claims**

1. A power panel arrangement for a free standing, space dividing, wall panel system comprising, in combination,

a ceiling panel adapted to be disposed in a suspended ceiling system, said ceiling panel having an aperture therethrough;

a hollow space dividing wall panel having a top edge adapted to be spaced a substantial distance below said ceiling panel, said top edge having an aperture therethrough communicating with the interior of said hollow space dividing wall panel;

a flexible tube interconnecting the aperture in said ceiling panel and the aperture in the top edge of said wall panel, and



at least one power outlet in at least one wall of said space dividing wall panel.

3,856,982

TELEPHONE DIALING ARRANGEMENT

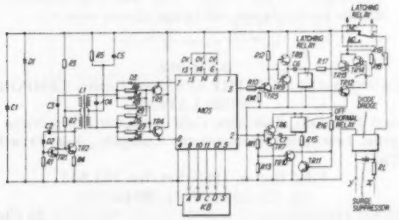
Anthony Newton Lawson, London, and Camilo Manasala Tabalba, Harlow, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 26, 1973, Ser. No. 354,837

Claims priority, application Great Britain, May 11, 1972, 22131/72

Int. Cl. H04m *1/44*

U.S. Cl. 179—90 K **5 Claims**



1. An outpulsing-unit for a telephone subscriber's instrument of the type having a push-button unit, which includes an electronic store into which the digits corresponding to the push-buttons operated by the subscriber are entered in the same order as that in which the push-buttons are operated, pulse generation means adapted to generate pulses at the rate and of the characteristics acceptable by an exchange to which the instrument is connected, distribution means for transferring the digits in said store one after the other to a control counter, means under control of said counter to pass an impulse train from said pulse generation means for each digit transferred thereto, the number of impulses in each said train corresponding to the digital value of the digit in said counter, a connection to an impulsing means over which each said impulse train drives said means so that each said impulse train is repeated to the line to the exchange, connections from said circuit elements to the line so that the outpulsing unit is powered from the exchange, and a capacitor connected to the line and to the outpulsing unit, which capacitor is charged from the line while the latter is looped and by its charge maintains the power supply to the outpulsing unit during break impulses.

3,856,983

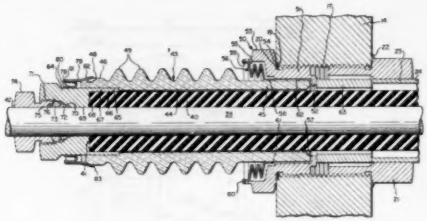
ELECTRICAL PENETRANT STRUCTURE

Edward Fisher, Buffalo; Wilbur S. Rautio, East Aurora; Roman Jankowiak, Cheektowaga, and Richard W. Natell, Eggertsville, all of N.Y., assignors to Conax Corporation, Buffalo, N.Y.

Filed June 30, 1972, Ser. No. 267,971

Int. Cl. G21c *13/04*; **H01b** *17/30*

U.S. Cl. 174—151 **13 Claims**



1. In an electrical penetrant structure, the combination comprising a wall member having an opening therethrough, a conductor extending through said opening, and means mounting said conductor on said wall member so as to allow longitudinal and lateral movement of said conductor relative to said wall member including a tubular sleeve of rigid electrical insulating material surrounding said conductor and having inner and outer end portions, said inner end portion being arranged adjacent said opening in spaced relation to said wall member to provide an annular space therebetween, first seal means sealingly connected to said wall member and sleeve and closing said space and allowing longitudinal and lateral movement of said sleeve relative to said wall member, and second seal means sealingly rigidly connecting said outer end portion to said conductor.

3,856,984

SYSTEM FOR ANTICIPATING AN IMPENDING LOSS OF INFORMATION AND FOR GENERATING A RESTRAINT SIGNAL IN RESPONSE THERETO

Eugene L. Merlino, Jr., Dearborn Heights; Roger S. Naeyaert, Jr., Grosse Point Woods, and Jonas Ellis, Birmingham, all of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 116,799, Feb. 19, 1971, abandoned. This application Sept. 19, 1972, Ser. No. 290,317

Int. Cl. H04l *1/00*

U.S. Cl. 178—23 A **7 Claims**

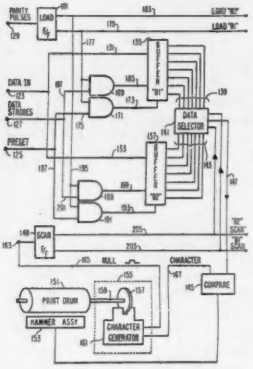
1. In a data transmission system including means for transmitting coded representations of characters in a stream of data, a pair of buffer storage units for alternately and individually receiving a coded representation of a character, a rotating print element having a plurality of characters and a reference location on the periphery thereof, means for alternately and individually scanning said buffer storage units and means for comparing the coded representation of a character stored therein with the characters on the periphery of said printing element for utilizing the character in printing and wherein the transmission of said representations of characters, and the utilization of character representations stored in said buffer storage units, as timed to the operation of said rotating print element, normally exist in a state of synchronization, a logic circuit for preventing a loss of information due to a variance from said normal state of synchronization comprising:

first means for detecting the satisfaction of a first logic condition wherein one of said pair of buffer storage units is scheduled to receive the next coded representation of

a character to arrive and is simultaneously being scanned for comparing the coded representation stored therein with the characters on the periphery of said rotating print element;

second means for detecting the satisfaction of a second logic condition, said second logic condition requiring the simultaneous occurrence of a pulse indicative of the frequency of rotation of said print element and a pulse indicative of the frequency of transmission of said coded representations;

means responsive to the simultaneous detection of the satisfaction of said first and second logic conditions for generating a triggering pulse;



first bistable means responsive to said triggering pulse for generating a restraint pulse and inhibiting the further transmission of said coded representations of characters;

second bistable means for normally enabling said restraint pulse-generating means, said means being responsive to said triggering pulse for disenabling said generating means and preventing the generation of more than one restraint pulse until said normal state of synchronization is restored; and

means responsive to conditions indicative of the restoration of said normal state of synchronization for returning said second bistable means to its normally enabling state.

3,856,985

ULTRASONIC DIAGNOSTIC APPARATUS

Hiromj Yokoi, Osaka; Kenichi Ito, Yokohama, and Kenji Mizobuchi, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi and Tokyo Electronic Industry Co., Ltd., Tokyo, both of, Japan

Filed May 17, 1973, Ser. No. 361,044
Int. Cl. H04m 7/18
U.S. Cl. 178—6 **36 Claims**

1. In ultrasonic diagnostic apparatus of the type including an ultrasonic wave transducer for transmitting an ultransonic wave toward an object to be examined and for converting the ultrasonic wave reflected by said object into an electric signal; and television means responsive to the electric signal for displaying the image of said object;

the improvement comprising:

means for energizing said ultrasonic wave transducer;

means for moving said transducer along said object;

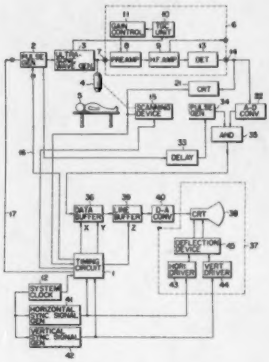
means for producing a position signal representing the position of said transducer;

said means for energizing said ultrasonic wave transducer including a first pulse generator for generating a pulse signal in response to said position signal, means driven by the output pulse from said first pulse generator for forming an ultrasonic oscillation signal, and means for applying said ultrasonic oscillation signal to said ultrasonic wave transducer;

a receiver for receiving the output signal from said transducer;

an analogue-digital converter for converting an analogue output from said receiver into a digital signal;

a data buffer means for storing the output from said converter;



a line buffer means for temporarily storing line data of the quantity corresponding to one horizontal scanning line of a television set, said line data being read out from said data buffer means;

means for converting the output signal from said line buffer means into a signal suitable to be displayed on said television means; and

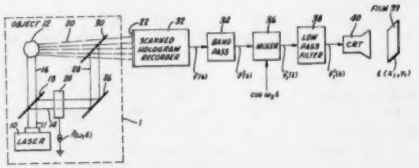
said television means including television display means responsive to the output from said signal converting means for displaying the image of said object.

3,856,986

SCANNED HOLOGRAPHY SYSTEMS USING TEMPORAL MODULATION

Albert Macovski, Palo Alto, Calif., assignor to American Express Investment Management Company, San Francisco, Calif.

Filed Dec. 6, 1968, Ser. No. 781,842
Int. Cl. G02b 27/22; H04n 9/54
U.S. Cl. 178—6.5 **26 Claims**



1. In a system for producing a hologram recording from which a three-dimensional image of a three-dimensional object may be reconstructed,

A. Means for illuminating the said object with an incident beam of light whereby said light is scattered by said object forming an object beam;

B. means for forming an image-information beam which includes

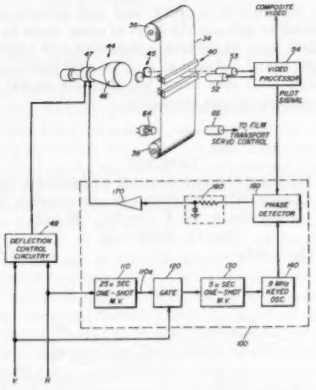
1. means for forming a light reference beam having substantially the same frequency spectrum as said object beam,
2. means for cyclically temporally offsetting the phase relationship between said reference and object beams, in a continuous manner over the period of a cycle,
3. means for combining said light reference beam and said object beam thereby to provide a light interference pattern containing information relative to conjugate images of the said object.

3,856,987

HORIZONTAL STABILIZING SYSTEM FOR FILM SCANNER

Renville H. McMann, New Canaan, and Joseph G. Petit, Stamford, both of Conn., assignors to Columbia Broadcasting System, Inc., New York, N.Y.

Filed Oct. 18, 1972, Ser. No. 298,534
Int. Cl. H04n *5/84*
U.S. Cl. 178—6.7 A **4 Claims**



1. In an apparatus for scanning a record medium having a succession of data frames along its length, said frames having recorded horizontally thereon a pilot pattern of constant predetermined frequency, said apparatus including a film transport for moving said film at a substantially uniform rate past a scanning position, beam scanning means including horizontal deflection means for scanning said frames with a beam in a horizontal scanline pattern at the scanning position, and means for deriving a pilot signal from the scanned pilot pattern, an improved system for continuously maintaining horizontal registration between frames being scanned and the scanning beam comprising;

means for generating, during horizontal scanlines, a reference signal of constant frequency;

means for comparing the phase of the derived pilot signal to the phase of the reference signal and for generating a correction signal in accordance with the comparison;

means for averaging said correction signal over a number of horizontal lines; and

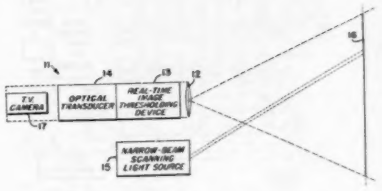
means for applying said correction signal to said horizontal deflection means.

3,856,988

SCANNING OPTICAL IMAGING SYSTEM WITH REAL-TIME IMAGE THRESHOLDING FOR THE ELIMINATION OF BACKSCATTERED LIGHT

Clarence J. Funk, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 24, 1973, Ser. No. 391,397
Int. Cl. H04m *3/12*
U.S. Cl. 178—6.8 **10 Claims**



1. A light modulation system to recreate an image field comprising:

illuminating means for illumination of a field object zone;

optical imaging means for providing an image of said field object zone;

first photoelectric transducer means positioned with respect to said optical imaging means to receive the image produced thereby for producing electrical analog signal of the image;

threshold means connected to said transducer means having a plurality of discreet areas for independently responding to electrical analog signal components having predetermined intensity characteristics;

optical transducer means connected to said threshold means and positioned to create an optical analog of the signals to which said threshold means has responded for recreating an optical image of only a predetermined portion of the original image; and

viewing means positioned with respect to said second photoelectric transducer means for utilizing the optical image recreated by said second photoelectric transducer means.

3,856,989

SENSORS HAVING CHARGE TRANSFER RECYCLING MEANS

Paul Kessler Weimer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 31, 1973, Ser. No. 393,628
Claims priority, application Great Britain, Sept. 25, 1972, 44295/72
Int. Cl. H04n *5/30*
U.S. Cl. 178—7.1 **14 Claims**

1. The combination comprising:

an array of sensing elements arranged in rows and columns, said elements producing a signal in response to electromagnetic radiation;

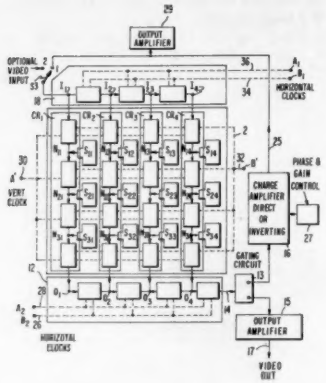
a number of nodes equal to the number of elements;

means for transferring, in parallel, the signal produced at each one of said elements to a different one of said nodes;

amplifying means having an input and an output;

charge transfer means coupled between each one of said nodes and the input of said amplifying means for transferring the signal from each node, to said amplifying means; and

charge transfer means coupled between the output of said amplifying means and each one of said nodes for recircu-



lating the signal, from a given node back to said given node.

3,856,990

CONTINUOUS FILM DRIVE FOR A TELECINE EQUIPMENT

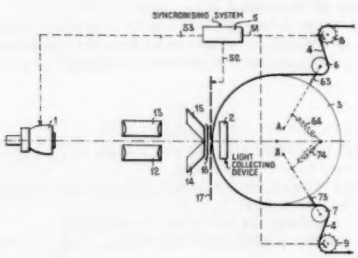
Michel Favreau, and Serge Vidal, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sept. 28, 1972, Ser. No. 292,941

Claims priority, application France, Oct. 22, 1971, 71.38066

Int. Cl. H04n *1/06*

U.S. Cl. 178—7.2 **7 Claims**



1. A continuous film drive device for a telecine equipment comprising a flying spot scanner tube, said flying spot scanner tube having a line sweep direction and a field sweep direction, an optical system, and modulated light collecting means, said drive device including a drum, the diameter of which is large as compared with the height of the frame of the films to be analysed, the circumference of which is in the form of a groove for receiving and supporting the portion of the film being scanned and the axis of which is parallel to said line sweep direction, an optical path between said optical system and said modulated light collecting means being provided inside said drum.

3,856,991

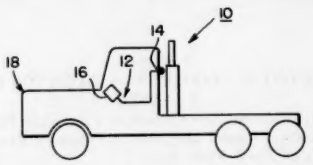
METHOD AND APPARATUS FOR CONTROLLING VEHICLE NOISE

Kenneth C. Kirkland, Jr., and Raymon E. Hunt, both of Longview, Tex., assignors to Garlock Inc., Palmyra, N.Y.

Filed May 7, 1973, Ser. No. 357,858

Int. Cl. G08g *1/10*

U.S. Cl. 179—1 P **26 Claims**



1. Apparatus for use in controlling the amount of noise made by a truck so that the truck can be operated in such a manner as to maintain the noise it makes within the legal range, comprising:

a. a transducer adapted to be mounted on a truck for sensing the amount of noise made by a truck, and

b. a noisometer connected to said transducer and adapted to be mounted on a truck, and said noisometer being calibrated to indicate the level of noise made by a truck on which said transducer is mounted and existing at a predetermined distance away from said transducer, said indicated level thus being less than the actual level of noise existing at said transduce..

3,856,992

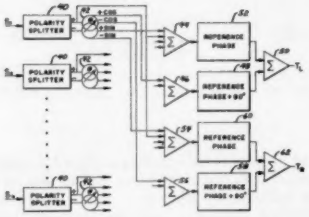
MULTIDIRECTIONAL SOUND REPRODUCTION

Duane H. Cooper, 918 West Daniel St., Champaign, Ill. 61820

Filed Oct. 6, 1971, Ser. No. 187,065

Int. Cl. H04r *5/00*

U.S. Cl. 179—1 GQ **17 Claims**



1. A signal-processing apparatus for use in the production or reproduction of multidirectional audio signals comprising matrixing means for producing a set of output signals from a set of input signals, each signal of at least one of said sets being identified with a different sound-direction bearing angle, means for mixing the input signals with mixing coefficients defined for each respective value of a 360° repetitive single-variable function of bearing angle for each output signal to provide the respective output signals, said single-variable functions having the characteristic that when each output signal is multiplied by the complex conjugate of the respective function of another bearing angle and all such products are added, the sum produced thereby is a sum of input signals each multiplied by a coefficient that is a function solely of the difference between both bearing angles.

3,856,993

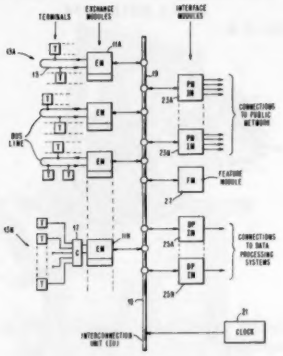
TIME DIVISION MULTIPLEX EXCHANGE

Felix H. Closs; Hans R. Mueller, both of Adliswil, and Daniel Wild, Kilchberg, all of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 206,614, Dec. 10, 1971, abandoned. This application Oct. 16, 1973, Ser. No. 407,003

Int. Cl. H04j 3/06

U.S. Cl. 179—15 AT 9 Claims



1. A time division multiplex communication system for exchanging information between any pair of a plurality of system terminals, comprising:

a plurality of exchange module means each having a bus line coupled thereto for connecting therewith any of a plurality of associated bus line terminals which are fewer in number than the number of system terminals, each of said exchange module means including bus line input and output means for exchanging information in first order time frames by synchronous time division multiplex between each of the respective said exchange module means and any of the said associated bus line terminals connected thereto, said bus line and output means including means to transmit and receive information to and from connected terminals over time channels in said first order time frames exclusively assigned to that purpose,

each of said exchange module means also including storage means coupled to its said bus line input means for receiving information from sending terminals connected thereto and storing said information for readout at a time corresponding to the time assigned to the terminal to receive said stored information;

interconnection unit means for interconnection each of said exchange module means with all of the others;

each of said exchange module means further including interconnection unit input and output means for exchanging information in second order time frames by synchronous time division multiplex between each of said exchange module means and the others, and interconnection unit input and output means further including selection and control means to cause said information to be exchanged between each of said exchange module means and the others by transmitting said information within time segments of said second order time frames with said time segments being divided into time slots equal in number to the number of exchange module means so that each said exchange module means is assigned an exclusive time slot within each time segment and with said time segments being equal in number to the number of said time channels in said first order time frames, said selection and control means being coupled to said storage means for causing said storage means to read out the appropriate stored information therein during the time slot and time segment respectively assigned to the exchange module means and associated receiving terminal to which said stored information is to be sent.

3,856,994

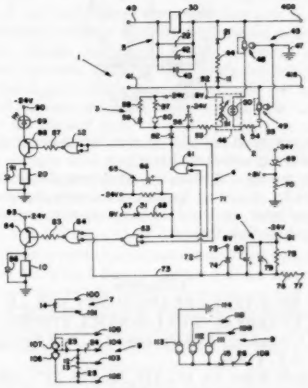
KEY TELEPHONE UNIT LINE CARD

Anthony T. Ozechoski, Erie, Pa., assignor to Basic, Inc., Cleveland, Ohio

Filed July 13, 1973, Ser. No. 379,174

Int. Cl. H04m 1/00

U.S. Cl. 179—99 21 Claims



1. A circuit for use in a key telephone system having a line capable of being in seized and unseized conditions, such line including input conductors on which periodic ring signals occur, comprising means for coupling said circuit to at least one of said input conductors to receive said ring signals, said means for coupling including means electrically isolating said circuit from said at least one of said input conductors for producing isolated signals in response to said ring signals and capacitive means for blocking DC signals on said input conductors from said circuit precluding false production of such isolated signals from noise, extraneous signals and the like on such input conductors, means coupled to said means for coupling for temporarily storing said isolated signals as stored isolated signals, means including selective resistor means for varying the duration for which said stored isolated signals are temporarily stored, logic circuit means coupled to said means for temporarily storing and responsive to said seized and unseized conditions of said line and to said stored isolated signals for producing logic output signals, said logic circuit means including a plurality of NOR gate circuits, and means responsive to said logic output signals for effecting indications of occurrence of said ring signals and of said seized and unseized conditions of said line.

3,856,995

PRESSURE GRADIENT PIEZOELECTRIC MICROPHONE

William Donald Cragg, and Stuart Bradley, both of Harlow, England, assignors to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 190,839, Oct. 20, 1971, abandoned. This application May 11, 1973, Ser. No. 359,300

Claims priority, application Great Britain, Oct. 22, 1970, 50130/70

Int. Cl. H04r 19/04, 1/02

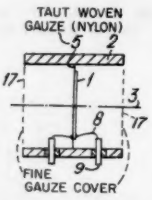
U.S. Cl. 179—121 R 11 Claims

1. A pressure gradient microphone comprising:

a hollow cylinder having two open ends of equal diameter;

a piezoelectric disc transducer; and

means for mounting said disc transducer within said cylinder such that the major surfaces of said disc transducer are normal to the longitudinal axis of the cylinder, said means for mounting including a foraminated membrane peripherally fastened to the inside surface of said cylinder, with said disc having one major surface thereof centrally arranged relative to said foraminated membrane and directly attached thereto;



said disc transducer when mounted in said cylinder by said means for mounting forming two empty chambers within said cylinder, each of said two chambers providing unrestricted air flow therein.

3,856,996

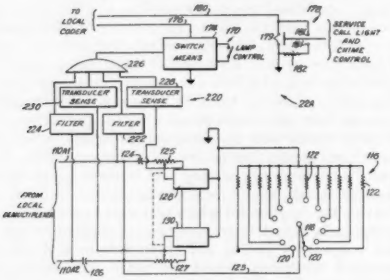
SELF-TEST ARRANGEMENT FOR AN ENTERTAINMENT-SERVICE SYSTEM

David R. Greenberg, 16 Serpentine Ln., Old Bethpage, Long Island, N.Y. 11804

Continuation of Ser. No. 152,645, June 14, 1971, abandoned, which is a division of Ser. No. 800,941, Feb. 20, 1969. This application July 6, 1973, Ser. No. 376,982

Int. Cl. H04r *29/00*

U.S. Cl. 179—175 **5 Claims**



1. A self-test arrangement for connection in a system having an output, an input, lamp means normally in an illumination mode in which said lamp means can provide illumination independent of any test function and capable of serving as a test-result indicator when disposed in a predetermined test state, manual switch means for selectively controlling said lamp means when said lamp means is in its illumination mode by providing signals for turning said lamp means on and off, and signal transmission means interconnecting said input, output and lamp means for transmitting at least said signals for turning said lamp means on and off when said lamp means is in said illumination mode comprising, means for selectively applying a test signal to said system input for transmission through said signal transmission means to said output, filter means connected to said system output for passing only an output signal substantially equal to the frequency of said test signal applied to said system input, and second switch means connected to said lamp means through said signal transmission means and to said filter means for disposing said lamp means in said predetermined test state without regard to the state of said manual switch means in response to said output signal from said filter means.

3,856,997

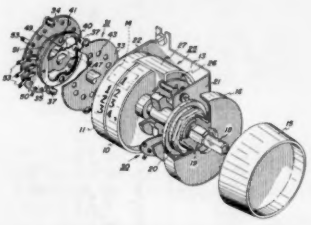
INDICATING AND SWITCHING APPARATUS

Robert J. Kilkes, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 26, 1972, Ser. No. 318,347

Int. Cl. H01h *19/58*

U.S. Cl. 200—5 R **9 Claims**



1. A selector apparatus for programming an automatic device comprising;

a shaft mounted for rotation;

a first rotary selector mounted to said shaft;

a second rotary selector rotatably supported about said shaft, said first and second rotary selectors being axially aligned along said shaft in a given sequence;

a first number indicator drum spaced from said rotary selectors, and mounted to said shaft, said first drum being connected to said first selector;

a second number indicator drum spaced from said rotary selectors, and rotatably supported about said shaft;

motion imparting means connecting said second rotary selector to said second drum, said motion imparting means including a hollow member connected to said second selector and means spaning said first drum for connecting said hollow member to said second drum,

said first and second drums respectively being axially aligned along said shaft in said same given sequence as said rotary selectors, for presenting a pre-selected count at a viewing station;

switching means operatively assoicated with each of said drums for generating an electrical signal indicative of a number presented within the viewing station.

3,856,998

KEYBOARD SWITCH ASSEMBLY WITH IMPROVED OPERATING MEANS

Dewey M. Sims, Jr., Westland, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed June 1, 1973, Ser. No. 366,128

Int. Cl. H01h *13/70*

U.S. Cl. 200—5 A **24 Claims**

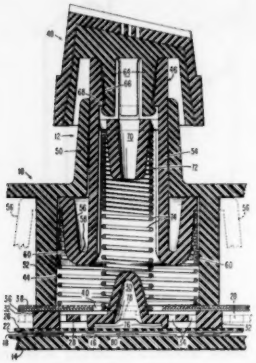
11. In a keyboard-type switch construction in which laminates are superposed in close proximity to one another, the combination:

a. a base panel having an electrically insulating surface divided into a plurality of switching areas;

b. an electrical conducting switch contact element carried upon said surface of the base panel within each of said switching areas;

c. a flexible diaphragm overlying the said plurality of switching areas of the base panel and normally supported in spaced relation thereto, said diaphragm carrying an electrical conductive switch contact element on the side thereof facing said base panel and within each of said switching areas thereof;

d. a depressible switch operating member located on the side of the diaphragm opposite to said base panel within each of said switching areas thereof and supported for movement toward and away from the base panel, each said member being effective upon depressive movement to engage and depress an adjacent portion of said diaphragm and thence to bring the switch contact element which is carried thereby within the switching area of the



depressed member into engagement with the fixed contact element within the corresponding switching area of the base panel; and

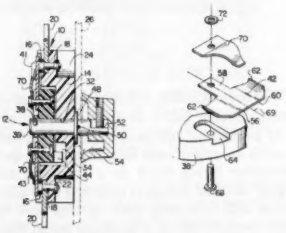
e. spring means opposing the depression of said member and resisting each such movement with a relatively low spring rate prior to engagement of said contact elements with one another and with a second higher spring rate following engagement of the contacts with one another.

3,856,999

ROTARY ELECTRICAL SWITCH WITH BRIDGING CONTACTOR

Stanley M. Terry, deceased, late of Dayton, Maine; Third National Bank of Springfield, executor, Springfield, Mass., and Alden J. Gray, Biddeford, Mass., assignors to Maremont Corporation, Saco, Mass.

Filed Jan. 3, 1974, Ser. No. 430,533
Int. Cl. H01h *19/58, 1/48*
U.S. Cl. 200—11 K **4 Claims**



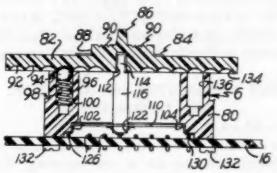
1. An electrical switch for concurrently switching a plurality of circuits, said switch comprising a stator block of electrically non-conductive material, a rotor block of electrically non-conductive material, means supporting said rotor block for rotation relative to said stator block about a first axis fixed relative to both of said blocks, stop means for limiting said rotation of said rotor block to rotation between first and second positions of said rotor block relative to said stator block, a plurality of groups of contacts on said stator block each of which groups of contacts includes a plurality of individual contacts angularly spaced from one another about said first axis and located in a plane generally perpendicular to said first axis, a plurality of contactors carried by said rotor block and each associated with a respective one of said groups of stator contacts, each of said contactors having a generally flat face located in a plane generally perpendicular to said first axis and arranged to wipe over its associated group of said stator contacts when said rotor block is rotated relative to said stator block, connecting means connecting each of said contactors to said rotor block and constraining said contactor to rotate with said rotor block about said first axis as said rotor block is rotated between said first and second positions, said connecting means including means providing a limited amount of looseness between said contactor and said rotor block in two degrees of freedom of movement, one of said two degrees of freedom involving movement of said face of said contactor toward and away from said plane of its associated stator contacts and the other of said two degrees of freedom involving rotation of said face of said contactor about a radial axis generally perpendicular to said first axis, said generally flat face of each contactor being of such length arcuately about said first axis as to contact and bridge two of said stator contacts when said rotor block is in said first position, and the angular displacement of said rotor block permitted by said stop means being such that as said rotor block is moved from said first position to said second position and said generally flat face of each contactor is moved out of contact with at least one of the two of said contacts contacted by said flat face in said first position of said rotor block, and a spring means for applying to each of said contactors a force urging the face of such contactor toward and against its associated contacts, said force being applied to such contactor at a point thereon which is located angularly between the two contcts bridged by said contactor when said rotor block is in said first position.

3,857,000

MULTI-POSITION SLIDE SWITCH ASSEMBLY WITH HOUSING MEANS HOLDING COMMON CONDUCTIVE RAIL IN FIXED ABUTTING RELATIONSHIP WITH END TERMINALS OF FIXED CONTACT ARRAY

Henry J. Boulanger, Cumberland, R.I., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed July 5, 1973, Ser. No. 376,638
Int. Cl. H01h *15/06*
U.S. Cl. 200—16 D **11 Claims**



1. A multiposition switch comprising a base, a plurality of stationary contacts mounted on the base electrically separated from one another and arranged in a row, a housing mounted on the base over the row of stationary contacts, a slide member, means for slidably mounting the slide member on the housing, the slide member slidable to and from a plurality of stable positions, an electrically conductive retainer mounted in the housing and electrically connected to one of the contacts in the row, a movable contact member disposed in the housing, the movable contact member in continuous electrical connection with the electrically conductive retainer, means operatively connecting the movable contact member with the slide member for movement therewith, the movable

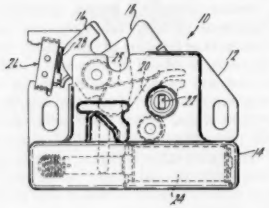
contact member being in electrical engagement with another respective stationary contact when the slide member is in each of its stable positions.

3,857,001

LOCK RELEASE WITH ALARM SWITCH MOUNTING MEANS

Norman G. Quantz, Algonac, Mich., assignor to Lectron Products Inc., Troy, Mich.

Filed June 20, 1973, Ser. No. 371,719
Int. Cl. H01h *9/02*
U.S. Cl. 200—61.64 **4 Claims**



1. A locking mechanism for releasably securing a hinged member to an associated frame,

said mechanism including movable latch means having securing and releasing positions and housing means attachable to one of said hinged member and said frame for operatively supporting said latch means in combination with a security system for detecting a forced opening of said hinged member including switch means for inactivating said system in response to movement of said latch means from said securing to said releasing position,

said housing means including locator means comprising a cut-out portion having a pair of oppositely spaced parallel edges for operatively positioning said switch in an actuatable position relative to said latch means;

and cooperative interlocking means including a clip having at least one end portion compressively engaged to one of said edges associated with said switch and said locator means for immovably retaining said switch in said operative position.

3,857,002

SAFETY MECHANISM FOR LAUNDRY APPLIANCES WITH DOOR LATCH FOR ACTUATING MAIN SWITCH

Robert Lay, Shelby, and Clayton L. Haller, Mansfield, both of Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 10, 1973, Ser. No. 387,392
Int. Cl. H01h *3/16*
U.S. Cl. 200—61.64 **8 Claims**

1. A safety mechanism for an automatic laundry appliance having a cabinet defining an access opening, door means hingedly supported on said cabinet for movement between open and closed positions and electrical circuit means for energizing said appliance in accordance with a predetermined program including energization of a main drive motor to a high speed drive operation and including a manually controlled main line switch, said mechanism comprising:

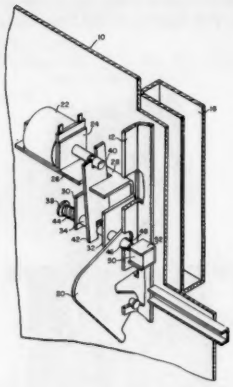
means for locking said door means in said closed position, said locking means including:

a locking pin movable between a first position preventing opening of said door means and a second position permitting opening of said door means;

spring means normally biasing said pin toward said second position;

electrically actuated means for moving said pin from said second position to said first position, said means electrically connected in said control circuit through first switch means; and,

second switch means connected in said circuit for energizing said main motor when closed, said second switch



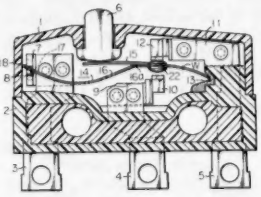
means being mounted generally adjacent and in the path of movement of said locking pin so as to be moved to a closed position in response to said pin moving from said second position to said first position.

3,857,003

MICROSWITCH

Minoru Nishio, Neyagawa, and Norio Sagawa, Osaka, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Sept. 12, 1973, Ser. No. 396,487
Claims priority, application Japan, Sept. 14, 1972, 47-107490
Int. Cl. H01h *13/36*
U.S. Cl. 200—67 DB **9 Claims**



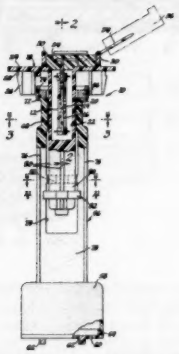
1. In a microswitch the combination comprising a case, a push button slidably fitted to said case, an actuating plate spring to be pushed by said push button, a supporting member engaging with an end of said actuating plate spring, said supporting member being fixed to a common terminal metal fitting, a pair of fixed contacts opposed to a movable contact provided on said actuating plate spring, said fixed contacts being fixed respectively to a terminal metal fitting through a supporting member, a bearing section engaging with the other end of said actuating plate spring and an insulating base supporting said terminal metal fittings, wherein said actuating plate spring has a pair of legs formed by punching so as to extend respectively toward each end substantially from intermediate part of the spring, one of said legs has a movable contact near the base and the free end of the other leg is opposed to the push button.

3,857,004

LIQUID LEVEL SENSOR

Keshav S. Kavthekar, Melvindale, and Edwin F. Clemett, Jr., Detroit, both of Mich., assignors to McCord Corporation, Detroit, Mich.

Filed June 8, 1973, Ser. No. 368,368
Int. Cl. H01h 35/18
U.S. Cl. 200—84 C 16 Claims



1. A liquid level sensor assembly for indicating, through an electrically-operated warning circuit, the liquid level of a fluid in a container comprising magnetic responsive switch means for movement between an open and closed position to control an electric circuit, support means for supporting said switch means, float means responsive to the level of the fluid, and magnet means supported by and movable with said float means for actuating said switch means; said support means including a top portion and guide means depending therefrom for guiding said float means, said guide means having a housing portion housing said switch means and a pilot portion having radially extending members with said housing means disposed adjacent said support means and said pilot portion disposed axially below said housing portion, said float means being adapted to move axially of said guide means and including a barrel portion guided by and surrounding said housing portion and supporting said magnet means and a follower portion depending axially below said barrel portion and having means for engaging said radially extending members to facilitate guided movement of said float means; said float means further including a buoyant member disposed axially below said follower portion.

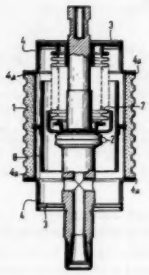
3,857,005

VACUUM SWITCH ASSEMBLY

Gerhard Peche, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 17, 1972, Ser. No. 218,249
Int. Cl. H01h 33/66
U.S. Cl. 200—144 B 1 Claim

1. A vacuum switch contact assembly comprising:
a unitary hollow cylindrical member composed of a ceramic material and having flat end surfaces;
a pair of metallic end plates for sealing the respective ends of said cylindrical member;
switch contact means supported by said end plates;
a pair of flange rings composed of an iron-nickel-cobalt alloy in contact with said end plates and with said flat end surfaces of the cylindrical member, each of said flange rings having an upstanding surface in vacuum-tight contact with one of said end plates and a horizontal flat flange surface in contact with a flat end surface of said cylindrical member;
a pair of counter rings composed of a ceramic material, each of said counter rings having a flat end surface in contact with a flat flange surface of a flange ring away from said cylindrical flat end surface; and



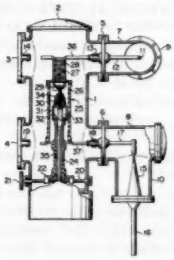
layers composed of a glass having a coefficient of thermal expansion similar to the coefficient of thermal expansion of said ceramic material and said iron-nickel-cobalt alloy, said layers being located between contiguous flange ring and cylindrical member flat end surfaces and between contiguous flange ring and counter ring end surfaces respectively, so as to form a vacuum-tight seal between said end surfaces.

3,857,006

GAS INSULATED SWITCHING APPARATUS

Goro Daimon; Seizo Nakano, and Tuneo Kishi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 30, 1973, Ser. No. 411,055
Int. Cl. H01h 33/80
U.S. Cl. 200—148 F 10 Claims



1. A gas insulated switching apparatus comprising a closed vessel filled with an electrical insulating gas, a circuit breaker unit disposed within said closed vessel and provided with an input side terminal conductor and an output side terminal conductor, drive means for causing reciprocating movement of said circuit breaker unit within said closed vessel, actuating means for actuating said circuit breaker unit for making and breaking the circuit, and disconnecting switch means connected to an input side electrical path and an output side electrical path respectively and adapted to be urged to one of the closed and open positions depending on the movement of said terminal conductors due to the movement of said circuit breaker unit.

3,857,007
ELECTRIC SWITCH

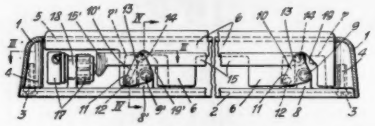
Gottfried Leuenberger, Schlieren, Switzerland, assignor to Peter Leuenberger, Zurcherstrasse, Switzerland

Filed Mar. 5, 1973, Ser. No. 337,819

Claims priority, application Switzerland, Mar. 8, 1972, 3491/72

Int. Cl. H01h *3/00*

U.S. Cl. 200—153 H **7 Claims**



1. An electric switch comprising:

a. a housing having a bar form with stationary supports extending inwardly,

b. a press key having a strip form which protrudes partially from the housing and is mounted for upward and downward movement within the housing,

c. said key extending approximately over the length of the housing,

d. a press switch mounted in the housing,

e. an operating rod being displaceable beside and extending in the longitudinal direction of the press key, and

f. at least two rotatable members having spindles and acting as bell-crank levers being mounted on the stationary supports and articulatedly connected to the operating rod,

g. said key being effective to rotate said rotatable members for displacing the operating rod in a longitudinal direction thereby operating the press switch,

h. said stationary supports having laterally protruding bearing projections for supporting said spindles,

i. said key having cutaway portions which bridge over the laterally protruding bearing projections.

3,857,008
ALTERNATE MAKE-BREAK TYPE SLIDE SWITCH WITH IMPROVED MOVABLE CONTACT

Johannes Martinus Augustines Henricus Van Der Donk, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 25, 1973, Ser. No. 382,590

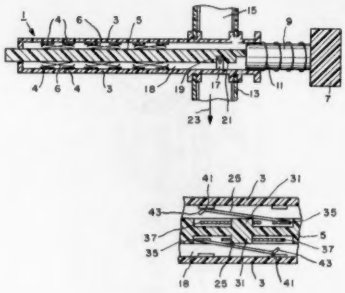
Claims priority, application Netherlands, Aug. 11, 1972, 7210971

Int. Cl. H01h *13/56, 1/44*

U.S. Cl. 200—153 J **10 Claims**

5. A slide switch comprising a housing having a wall defining a longitudinal direction, two stationary contact members carried on said wall within said housing, a strip-like slide mounted for longitudinal movement between first and second operative positions within said housing, a movable contact member carried on said slide for cooperative engagement with a stationary contact member, and means connected to said slide for causing longitudinal movement thereof, said movable contact comprising a central part, means carried by said central part for attaching said movable contact to said slide, two extension members extending in diametrically opposed directions from said central part, a connecting strip extending from each of said extensions in opposite directions and substantially perpendicular to said extensions and having a length greater than its width, a pair of resilient fingers each connected at one end thereof to one of said connecting strips, said fingers extending in parallel opposed directions and being located on opposite sides of said central part, and a contact area carried on the free end of each of said fingers for contact with a stationary contact member, said central part and said pair of fingers being integrally formed of a substantially flat plate-like material.

8. The slide switch according to claim **5** further comprising locking means for locking said slide in said second position,



reset means for releasing said locking means for returning said slide to said first position, and enlarged contact areas carried by said stationary contacts for maintaining contact with said movable contacts when said slide is moved to said second position.

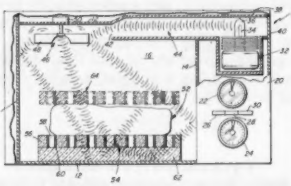
3,857,009
MICROWAVE BROWNING MEANS

George H. MacMaster, Lexington, and Kenneth W. Dudley, Sudbury, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Sept. 10, 1973, Ser. No. 395,469

Int. Cl. H05b *9/06*

U.S. Cl. 219—10.55 **14 Claims**



1. In combination:

an enclosure;

means for radiating microwave electromagnetic energy within said enclosure;

a load; and

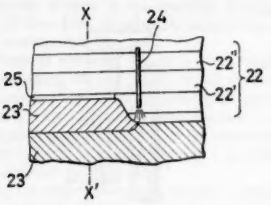
means for supporting said load within said enclosure comprising means for converting and transforming free space energy waves into a fringing electric field pattern having a substantially 180° phase differential in close proximity to the exterior surfaces of said load;

said converting and transformer means comprising alternate regions of high and low dielectric loss characteristics

3,857,010
METHOD FOR WELDING MULTI-LAYER LAMINATED WORK PIECES

Yasuhiro Nishio; Yoshiriro Yamamoto; Zenichiro Okamoto; Nagio Minami, and Masazumi Nagareda, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1973, Ser. No. 345,306
Int. Cl. B23k *31/06*
U.S. Cl. 219—61 **5 Claims**

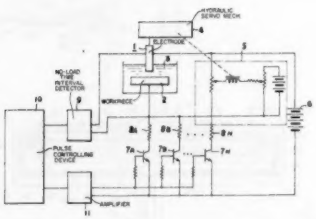


1. A method of butt-welding multi-layer laminated metal work pieces in end-to-end relation by multi-pass deposition of molten weld metal between facing ends of the laminated work pieces to weld-unite the same, comprising the steps of, during each pass, depositing molten metal, between the facing ends, from a metal welding rod; performing successive passes by moving the welding rod along a line extending at an acute angle to the contacting surfaces of adjacent layers of the work pieces to form a series of superposed welding beads extending at such acute angle to the contacting surfaces.

3,857,011
METHOD AND APPARATUS FOR CONTROLLING ELECTRICAL DISCHARGE SHAPING

Nagao Saito; Kazuhiko Kobayashi, and Naokazu Tomimoto, all of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 27, 1973, Ser. No. 401,141
Claims priority, application Japan, Sept. 30, 1972, 47-98386
Int. Cl. B23p *1/08*
U.S. Cl. 219—69 P **5 Claims**

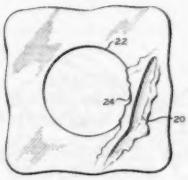


1. In a method for controlling an electrical discharge shaping by intermittently applying a discharge current pulse across a working gap with a quiescent time interval, the improvement which comprises the steps of detecting a no-load interval between discharge pulses before applying a voltage across the working gap to generate the discharge; and controlling said quiescent time interval as a function of said no-load time interval.

3,857,012
METHOD OF REPAIRING SPINNERETTES

Albert F. Stegelman, Greenville, and Arnold Michalski, Piedmont, both of S.C., assignors to Phillips Fiber Corporation

Filed Aug. 20, 1973, Ser. No. 389,734
Int. Cl. B23k *9/16*
U.S. Cl. 219—69 M **13 Claims**



1. A method for repairing a spinnerette having on its face a damaged area bordered by an undamaged area, which method comprises:

electrically removing metal from said damaged area and said bordering undamaged area of said face by electrical discharge machining and thereby blending the surface of said damaged area into the surface of said undamaged area.

3,857,013
METHODS OF AND APPARATUS FOR JOINING MATERIALS

Paul Joseph Niesse, Norcross, Ga., assignor to Western Electric Company, Incorporated, New York, N.Y.

Continuation of Ser. No. 178,921, Sept. 9, 1971, abandoned. This application June 25, 1973, Ser. No. 373,349
Int. Cl. B23k *1/00*
U.S. Cl. 219—85 **15 Claims**

1. A method of joining an end portion of one conductor to an end portion of another conductor, which includes the steps of:

supporting a disc of fusible material;

holding the end portions of the conductors aligned axially and in engagement with each other;

spacing the end portions of the conductors from each other;

moving the disc of fusible material in a first direction and between the end portions of the conductors;

arresting the movement of the disc when at least the required amount of fusible material to form a joint is positioned between the conductors;

subjecting the disc of fusible material to forces to urge the disc in a second direction opposite to the first direction to a position spaced from the end portions of the conductors;

urging the end portions of the conductors axially into compressive engagement with the disc, the compressive frictional forces with the disc being sufficient to overcome the forces urging the disc in the second direction and hold the fusible material therebetween and enable a first electrical circuit through the conductors and the portion of the fusible material held therebetween and to enable a second electrical circuit through the portion of the fusible material in the joint and portions of the disc spaced therefrom;

connecting the first circuit across a source of electrical current;

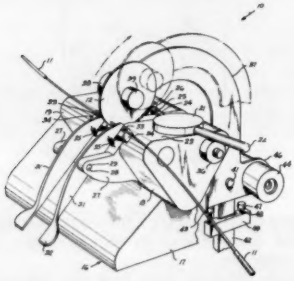
the first circuit being normally disabled prior to the energization of the second circuit, the first circuit being in a first mode and capable of increasing the amount of current to the joint when the second circuit is energized and being in a second mode capable of reducing the amount of current to the joint when the second circuit is de-energized;

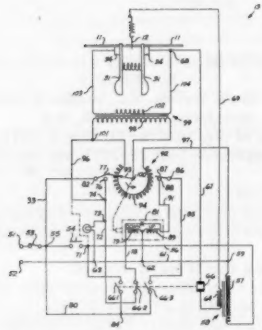
energizing the second circuit to switch the first circuit to the first mode;

controlling the application of current through the first circuit and the conductors and the fusible material therebetween to increase gradually the current to melt the fusible material between the conductors and permit the forces to urge the unmelted portion of the disc in the second direction out of engagement with the melted portion and interrupt the second circuit to de-energize the second circuit and switch the first circuit to the second mode;

further controlling the application of current through the joint to decrease the current supplied thereto to cool the joint and solidify the fusible material; and

discontinuing the application of current to the joint while disabling the first circuit and conditioning the first circuit for another cycle of operation.





3,857,014

ELECTRON BEAM GENERATOR

Garald Petrovich Prudkovsky, Lomonosovsky prospekt, 18, kv. 534; Alexandra Vasilievna Khotina, ulitsa Zelenodolskaya, 14, kv. 35, korpus 2; Nikolai Gavrilovich Sushkin, ulitsa Chernyshevskogo, 37, kv. 13; Lev Nikolaevich Kopnev, ulitsa Chertanovskaya, 4, korpus 1, kv. 142, and Sergei Filippovich Merzlikin, ulitsa Neglinnaya, 9, kv. 6, all of Moscow, U.S.S.R.

Continuation of Ser. No. 174,771, Aug. 25, 1971, abandoned. This application Jan. 2, 1973, Ser. No. 320,678

Int. Cl. B23k *15/00*

U.S. Cl. 219—121 EB **8 Claims**

1. An electron-beam generator, comprising: a cathode with a thermionic emitter and emitting an electron-beam, an anode, an acceleration and shaping region where the electron beam is accelerated and shaped, an additional electrode disposed opposite said emitter and having a negative potential relative to said anode; an electromagnetic system means for establishing a magnetic field with the lines of force thereof curved through an angle substantially equal to 90°, said cathode, anode, additional electrode and electromagnetic system means being disposed and orientated with respect to one another so as to define field generating means providing a combined electric and magnetic field acting upon the electron beam in the direction of said curve of the magnetic field lines of force for bending the electron beam in a plane of the magnetic field lines through an angle larger than said angle of curvature of the magnetic field lines by a value substantially equal to 90°, with the result that in said acceleration and shaping region the electron beam travels across the magnetic field lines of force and upon completion of said acceleration and shaping the electron beam travels along said lines without undesirable transverse pulsations.

3,857,015

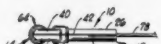
ELECTRICALLY HEATED HEAT SEALING IMPLEMENT

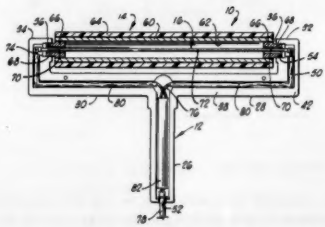
Glenn W. Clark, Topeka, Kans., and Oliver F. Richardson, 6223 Rex Dr., Dallas, Tex., assignors to Oliver F. Richardson, Dallas, Tex. and Shirley Fleshman, Oklahoma City, Okla.

Filed Nov. 8, 1972, Ser. No. 304,600

Int. Cl. H05b *1/00*; **D06f** *75/00*

U.S. Cl. 219—244 **6 Claims**





1. A heat seal implement for applying heat to portions of a heat sealable wrapping material, comprising:

a roller assembly, comprising:

a cylindrically shaped roller base having an opening extending therethrough intersecting the opposite sides thereof;

a roller contacting surface formed about the outer surface of the roller base contactable with the wrapping material constructed of a material substantially reducing adhesion between contacted portions of the wrapping material and the roller contacting surface; and,

a bearing member connected to each end of the roller base;

roller support means rotatingly supporting said roller assembly, comprising:

a lower support element, having an upwardly facing surface, a cavity formed in the upwardly facing surface, portions of the cavity engaging in supporting a portion of each bearing member; and,

an upper support element, having a downwardly facing surface engaging the upwardly facing surface of the lower support element in an assembled position and cooperating with the lower support element to form the roller support means, a portion of the assembled upper and lower support elements forming a handle portion in the assembled position; and,

means heating the roller contacting surface, comprising:

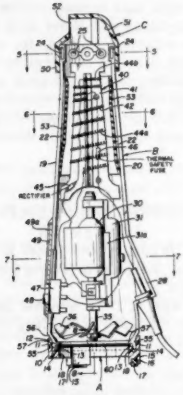
a heating element extending through a portion of the opening through the roller base; and,

conductor means connected to the heating element and connectable to an electrical energy source for supplying electrical energy to the heating element when in electrical communication therewith, a portion of the conductor means disposed within a portion of the cavity of the lower support element.

3,857,016
DEVICE FOR DRYING HAIR

Roy E. Meyer, and John F. Wahl, both of Sterling, Ill., assignors to Wahl Clipper Corporation, Sterling, Ill.

Filed May 17, 1973, Ser. No. 361,219
Int. Cl. H05b *1/00*; A45d *20/08*; F24h *3/04*
U.S. Cl. 219—368 4 Claims

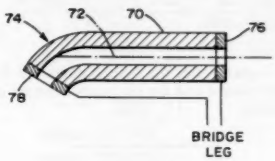


1. A device for drying hair comprising a base having a circular rim providing a circular inlet opening at the bottom of said rim and having at least three radially spaced legs depending from said rim, said rim containing a circular downwardly extending groove, an elongated tubular casing frustoconical in shape having a circular lower edge engaging said groove said casing having its longitudinal axis extending vertically from the center of said base, a hollow cap having rigid walls and having a lower cylindrical portion which extends over the upper portion of said casing, said cap having an internal passage through which air may exit from said device, said passage containing an exit opening facing in a horizontal direction, a fan in the lower portion of said casing, a motor within said casing and arranged to drive said fan, and an electrical heating element in the upper portion of said casing, said base being adapted to set on a horizontal surface with said legs resting on said surface, whereby rotation of said fan draws air horizontally between said surface and said rim and passes the air upwardly within said casing and cap and outwardly from said cap in a horizontal direction

3,857,017
UNITARY THERMAL REFERENCE SOURCE

Carl H. Whittier, Wayland, Mass., assignor to Dynarad, Inc., Norwood, Mass.

Filed Apr. 20, 1972, Ser. No. 245,773
Int. Cl. H05b *1/02*
U.S. Cl. 219—501 4 Claims



1. A thermal reference comprising:

a generally hollow, cylindrical structure open at each end and formed of an electrically resistive material having a significantly non-zero resistance temperature coefficient; said cylindrical structure having an elbow curve in a portion thereof whereby an interior surface of said structure occludes the view through said cylindrical structure from end to end;

first and second terminals on said structure at said ends for receiving electrical current;

means for applying electrical current to said structure at said first and second terminals to provide a distributed current through said structure;

the flow of electrical current through said structure being directly operative to simultaneously affect the temperature, radiation, and resistance of said structure.

3,857,018
CONTROLLED ACCESS SYSTEMS

Richard M. Stark, Long Lake, and Ronald G. Beachem, Mound, both of Minn., assignors to Business Electronics, Inc., Minneapolis, Minn.

Filed Dec. 7, 1973, Ser. No. 422,753
Int. Cl. G06k *5/00*; H04q *3/00*
U.S. Cl. 235—61.7 B 15 Claims

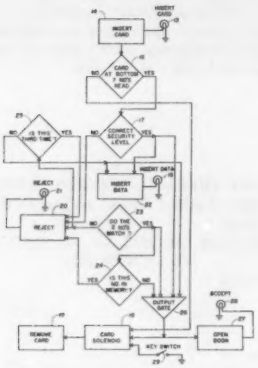
1. A system for security control of a desired operation comprising:

a series of identification cards having individually distinct but nondiscrete information as a part of each card;

means for programming said system with a system program to read a random selection of information from the cards; input means for entering the system program and for enabling a user to enter memorized information into the system;

information sensing means to read the random selection of information in accordance with the system program;

means for comparing the memorized information to the randomly selected information obtained from the cards to determine whether or not they are identical; and



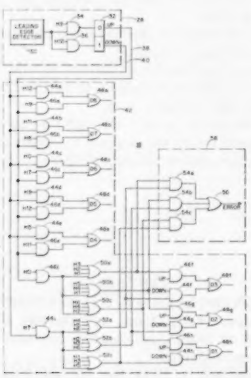
means for implementing the desired operation if the memorized information and the randomly selected information are identical.

3,857,019

CARD READER DATA LOGIC WITH POSITION INDICATION AND ERROR DETECTION

Thomas O. Holtey, Newton Lower Falls, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Mar. 5, 1973, Ser. No. 337,975
Int. Cl. G06k *5/00*
U.S. Cl. 235—61.11 A **13 Claims**



1. A card reader system in combination with a plurality of cards having information indicia thereon and adapted to be inserted into said system, said system comprising:

means for indicating whether each of said plurality of cards is in a first or a second position,

means for detecting said information indicia to produce a plurality of first signals corresponding to said information indicia,

means responsive to said indicating means and to said detecting means for generating a plurality of second signals, said plurality of second signals being less in number than said plurality of first signals, and

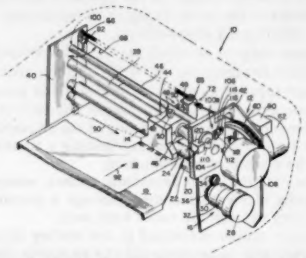
means responsive to said detecting means and said indicating means for producing an error signal indicating that said detecting means has detected incorrect information.

3,857,020

AUTOMATIC LINE TRACKER

Roy F. Higginbotham; Leland A. Melugin, both of Plantation, Fla., and Donald Carl Hendrickson, deceased, late of St. Petersburg, Fla. (by William L. Stanford, administrator), assignors to Datatype Corporation, Miami, Fla.

Filed Sept. 28, 1973, Ser. No. 401,935
Int. Cl. G06k *7/10*
U.S. Cl. 235—61.11 E **23 Claims**



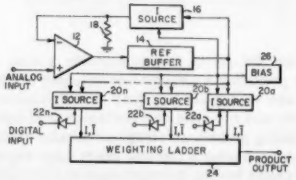
1. Means for optically reading a bar code consisting of a plurality of character code groups serially arranged along a transversely extending line on an input media, each code group including a plurality of bit spaces serially arranged along the line with certain of said bit spaces containing longitudinally extending bars, said reading means comprising a scanning head and means for supporting said head for movement along and above the line, said scanning head carrying light source means for projecting light at the media, a light-responsive semiconductor device, and optical means for projecting light reflected from the media toward said semiconductor device, whereby the presence and amount of light on said device depends upon the presence or absence and position of said code bars, said support means including a transverse bar extending along and above such a line and guiding said head, means mounting said bar for shifting movement longitudinally in the direction of extension of such code bars, drive means for shifting said bar to keep said scanning head above and tracking said line, and control means dominating said drive means, said control means being operatively connected between said semiconductor device and said drive means.

3,857,021

MULTIPLYING CURRENT MODE DIGITAL-TO-ANALOG CONVERTER

Samuel Wilensky, Waltham, and James K. Roberge, Lexington, both of Mass., assignors to Hybrid Systems Corporation, Burlington, Mass.

Filed Apr. 3, 1972, Ser. No. 240,654
Int. Cl. G06g *7/16*; **G06j** *1/00*
U.S. Cl. 235—150.52 **13 Claims**



1. A multiplying digital-to-analog converter comprising:

means for receiving an analog input signal for multiplication;

means for receiving a digital input signal for multiplication by said analog input signal;

a plurality of controllable current sources each responsive to an analog control signal and producing a current output signal representative of said control signal;

means for providing a feedback signal from one of the current output signals;

means receiving said analog input signal and said feedback signal for generating said analog control signal representing the difference between said analog input signal and said feedback signal over a range of values for said analog signal including very low signal levels, whereby said feedback signal provides in said control signal regulation of the operation of the other of said plurality of current source means;

means operative in response to each bit of said digital signal for selectively inhibiting a current output from corresponding ones of said plurality of controllable current sources in correspondence with the binary state of the bit; and

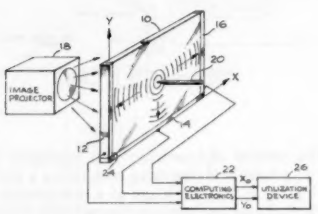
low settling time means for summing said selectively inhibited current output signals in a weighted manner to produce an analog output signal proportional to the magnitude represented by said digital input signal multiplied by the magnitude represented by said analog input signal.

3,857,022

GRAPHIC INPUT DEVICE

George J. Rebane, Semi Valley, and Norman R. Grossman, Los Angeles, both of Calif., assignors to Integrated Sciences Corporation, Santa Monica, Calif.

Filed Nov. 15, 1973, Ser. No. 416,172
Int. Cl. G06f *15/32*; G01s *3/80*
U.S. Cl. 235—151 **7 Claims**



1. A system for generating signals, respectively X_o, Y_o, which are representative of the locus of a point from which sound originates on a rectangular screen, relative to an origin point, comprising

first, second and third transducer means, positioned along first, second and third sides of said screen for generating first, second and third signals in response to the sound from said sound originating locus being received by said respective first, second and third transducer means through the material of said screen,

means responsive to the difference between the time of generating said first and second signals to generate a fourth signal representative thereof,

means responsive to the difference in the time of generating said second and third signals to generate a fifth signal representative thereof,

means for generating a quantity representative of the velocity of sound through said screen divided by two,

means for multiplying said fourth signal by said quantity representative of the velocity of sound through said screen divided by two to produce a sixth signal representative thereof,

means for multiplying said fifth signal by said quantity representative of the velocity of sound through said screen divided by two to produce a seventh signal representative thereof,

means for generating an eighth signal representative of the length of one side of said screen divided by two,

means for adding said sixth, seventh and eighth signals to produce a resultant signal equal to X_o,

means for subtracting said sixth signal from said seventh signal to produce a resultant signal, and

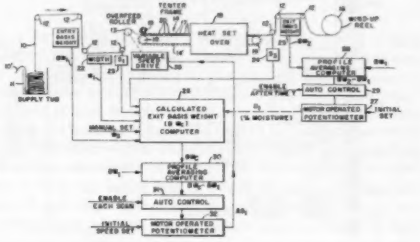
means for adding said eighth signal to said last named resultant signal to produce a signal representative of Y_o.

3,857,023

METHOD AND APPARATUS FOR IMPROVING THE UNIFORMITY OF THE BASIC WEIGHT OF A FABRIC

Robert Eugene McCall, Dublin, Ohio, assignor to Industrial Nucleonics Corporation, Columbus, Ohio

Filed June 21, 1973, Ser. No. 372,303
Int. Cl. D06c *3/00*
U.S. Cl. 235—151.1 **7 Claims**



1. A method of improving the uniformity of the basis weight of a travelling web of textile fabric at the exit side of fabric heat setting apparatus which includes a source of wet fabric supply, means for heat setting the fabric, tentering means for obtaining a uniform standard width of the fabric at the exit side of said heat setting means and for regulating the longitudinal shrinkage of the fabric by said heat setting means, overfeed means for moving said fabric web from the source of supply onto said tentering means, means for winding up said fabric web after it has passed through said heat setting means and means, for varying the speed of said overfeed means, comprising the steps of generating a signal BW_1 indicative of the measured basis weight of the fabric on the entry side of said heat setting means, generating a signal W_1 indicative of the measured width of the fabric on the entry side of said heat setting means, generating a signal S_1 indicative of the measured speed of the web on the supply side of said tentering means, generating a signal S_2 indicative of the measured speed of the web on the exit side of said heat setting means, generating a signal BW_2 indicative of the measured basis weight of said fabric on the exit side of said heat setting means, generating a signal BW_t indicative of a predetermined target basis weight for the web on the exit side of the heat setting means, comparing the signal BW_2 with the signal BW_t and producing an error signal BW_2–BW_t which corresponds with the deviation of the signal BW_2 from BW_t, initially setting a signal D_1 indicative of an estimated percent moisture content of the web on the entry side of the heat setting means, and thereafter automatically increasing the signal D_1 to indicate an increased percentage moisture when BW_2 is greater than the BW_t and decreasing the signal D_1 to indicate a decreased percentage moisture when BW_2 is less than BW_t in proportion to the magnitude of deviation of BW_2 from BW_t, generating a signal BW_c indicative of a calculated exit basis weight according to the formula:

$$BW_c = [BW_1/(1 + D_1)] \cdot (W_1/W_s) \cdot (S_1/S_2)$$

wherein BW_c, BW_1, W_1, S_1, S_2 and D_1 respectively represent previous indicated signals and W_s represents a preset signal indicative of a selected standard width for said fabric at the exit side of the heat setting means, comparing the signal BW_c with the signal BW_t and generating an error signal BW_c–BW_t

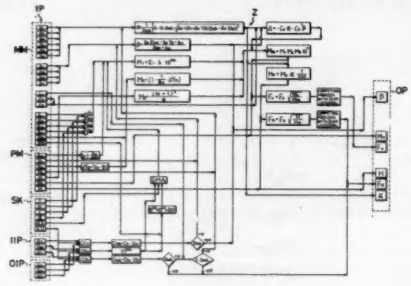
which corresponds with the deviation of BW_c from BW_f and increasing the speed of the overfeed means when the signal BW_c is less than the signal BW_f and decreasing the speed of the overfeed means when the signal BW_c is greater than the signal BW_f.

3,857,024

METHOD FOR COMPUTING MAIN, FLASH AND BUMP EXPOSURES FOR DIRECT SCREENING

Takeshi Kosaka, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 30, 1973, Ser. No. 327,919
Claims priority, application Japan, Feb. 4, 1972, 47-12972
Int. Cl. G06f *15/20*; G03b *27/78*
U.S. Cl. 235—151.3 **2 Claims**



1. A method for computing main, flash and bump exposures for direct screening comprising the steps of:

a. preparing a graph of experimental values giving as parameters densities of highlight, intermediate tone and shadow areas of an original plotted respectively against dot percent and parallelly shifting, the curves representing the relation between the dot percent and the density of the original at varying bump exposure percents to concentrate their 50% points at the 50% point of a curve representing the case in which only a main exposure is made and to thereby obtain a graph of bump exposure showing the relation between the dot percent and density difference,

b. determining from the graph of bump exposure values of coefficient to obtain an equation of lower degree for computing a bump exposure percent,

c. parallelly shifting curves in the graph of experimental values representing the relation between the dot percent and the density of the original at varying amounts of flash exposure to concentrate their 50% points at the 50% point of a curve representing the case in which only a main exposure is made and to thereby obtain a graph of flash exposure showing the relation between the dot percent and density difference,

d. determining from the graph of flash exposure values of coefficients to obtain an equation of lower degree for computing an amount of flash exposure,

e. forming an equation of lower degree for computing an amount of main exposure from an energy of light providing a predetermined density to the original, the effects of the bump exposure and flash exposure on the intermediate tone area, the sensitivity of a negative film including the conditions for developing the same, the diaphragm aperture value for setting the amount of the main exposure, the variation of the dot percent set for the intermediate tone area from the 50% point, and determined coefficients

f. forming an equation of lower degree for computing an amount of bump exposure from the amount of main exposure, the bump exposure percent, a film speed for each color plate and developing conditions,

g. forming an equation of lower degrees for computing the diaphragm aperture value for main exposure photography from the main exposure amount computing equation,

h. forming an equation of lower degree for computing the diaphragm aperture value for bump exposure from the bump exposure amount computing equation, and

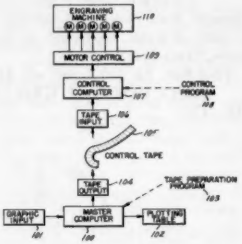
i. feeding the foregoing parameters and the determined coefficients in a desired combination to a computer incorporating electrical digital computing circuits for calculating from the equations the main, flash, and bump exposure amounts for direct screening.

3,857,025

NUMERICALLY CONTROLLED ENGRAVING MACHINE SYSTEM

Myrle H. English, West Chester, Pa.; Laurence Goodstal, Ilion, N.Y.; Wayne E. Leek, Mohawk, N.Y.; Robert J. Sanzo, Ilion, N.Y.; Robert L. Turner, Newark, Del.; Clark B. Workman, Mohawk, N.Y., and Edward W. Yetter, West Chester, Pa., assignors to Remington Armo Company, Inc., Bridgeport, Conn.

Filed May 7, 1971, Ser. No. 141,136
Int. Cl. G05b *19/42*; B23c *1/16*
U.S. Cl. 235—151.11 **28 Claims**



1. The method of translating into numerical indicia the course of a hand-held engraving tool having a tip making an engraving cut in the face plane of a substantially flat workpiece so that said cut may be automatically simulated by a computer-controlled, powered engraving tool, comprising the steps of:

a. defining the course of the hand-held tool as a plurality of component motions given as independent variables X, Y, Z, α, and a dependent variable θ, where:

X is the lateral motion of the tool substantially parallel to the face plane of the workpiece;

Y is the motion of the tool perpendicular to X and substantially parallel to the face plane of the workpeice;

Z is the depth motion of the tool substantially perpendicular to the face plane of the workpiece;

α is the tilting motion of the tool about an axis passing through the cutting tip of the tool and substantially parallel to the face plane of the workpiece; and

θ is the rotational motion of the tool about an axis passing through the cutting tip of the tool and substantially perpendicular to the face plane of the workpiece, and further wherein θ is the heading of the tool defined as the angle of the tangent to the tool path at the cutting tip of the tool;

b. defining each variable as a function of a common parameter: the string length "u" along the cutter point path, thus:

$$X = f_x(u)$$
$$Y = f_y(u)$$
$$Z = f_z(u)$$
$$\theta = f \quad (u)$$
$$\alpha = f \quad (u);$$

c. expressing each variable as a polynomial in u; such as:

$$X = a + bu + cu^2 + du^3 + \ldots$$
$$Y = e + fu + gu^2 + hu^3 + \ldots$$
$$Z = i + ju + ju^2 + lu^3 + \ldots$$
$$\theta = m + nu + pu^2 + qu^3 + \ldots$$
$$\alpha = r + su + tu^2 + vu^3 + \ldots$$

d. programming a digital computer to derive the coefficients of the polynomial equations of (c);

e. deriving by means of said digital computer said coefficients and

f. controlling the course of the powered engraving tool by means of said coefficients to regenerate the course of said hand-held engraving tool making an engraving cut.

3,857,026

PROPORTIONAL PULSE GENERATOR

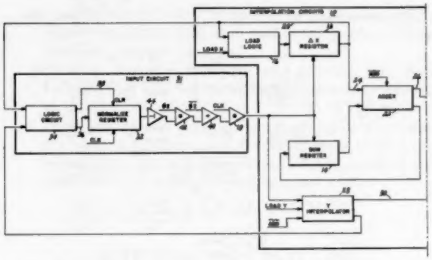
Gerarous Adrianus Mous, Overloon, Netherlands, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

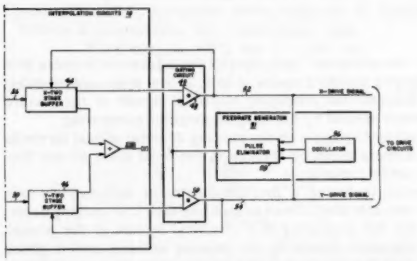
Filed Oct. 29, 1973, Ser. No. 410,880

Claims priority, application Great Britain, Mar. 1, 1973, 10035/73

Int. Cl. G06f *15/46*

U.S. Cl. 235—151.11 **6 Claims**





1. An apparatus for generating at least two sets of drive pulses causing a movable member to move along at least two axes of motion at a predetermined velocity along a predetermined path, said path being defined by input signals representing displacements along each axis of motion, the apparatus comprising:

a. means responsive to the drive pulses for producing a feedrate signal representing a velocity along one of the axes of motion having the largest displacement;

b. means responsive to the input signals and the drive pulses for generating a set of overflow pulses for each axis of motion by iteratively incrementing the magnitude of the input signals at a fixed rate, said generating means being interrupted upon a number of overflow pulses for the one of the axes of motion exceeding by a predetermined number the number of corresponding drive pulses produced; and

c. means responsive to the generating means and the feedrate signal for producing a set of drive pulses for each axis of motion, said drive pulses causing the movable member to move at the predetermined velocity along the predetermined path.

3,857,027

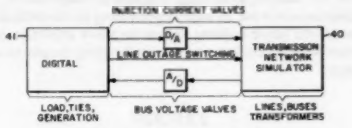
D.C. MODULES EMPLOYED FOR SIMULATING ELECTRIC POWER SYSTEM FOR LOADFLOW AND TRANSIENT STABILITY STUDIES

Norman R. Carlson, Export, and William E. Zitelli, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 19, 1972, Ser. No. 255,048

Int. Cl. G06j *1/00;* **G06f** *15/06, 15/56*

U.S. Cl. 235—151.21 **22 Claims**



1. A DC circuit for representing an electric power system load for operation under steady state and transient conditions and comprising a first circuit for generating at least one output current phasor signal corresponding to a first coordinate component of at least the bus to load current from the actual bus to which the load is connected, a second circuit for generating at least one other output current phasor signal corresponding to a second coordinate component of at least the bus to load current from the actual bus to which the load is connected, each of said first and second circuits including means for receiving input phasor voltage signals corresponding to first and second coordinate components of actual bus voltage, and means for representing the load admittance in each of said first and second circuits so as to generate said output current phasor signals with the desired correspondence.

3,857,028

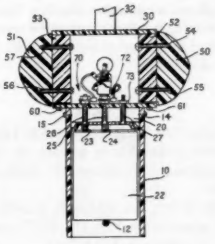
BATTERY OPERATED LAMP

Leslie E. Olsen, 1894 Locust St., Reno, Nev. 89502

Filed Sept. 7, 1973, Ser. No. 394,974

Int. Cl. F21 *11/00*

U.S. Cl. 240—10.63 **7 Claims**



1. A roadway signaling device comprising: A tubular base having one end open and one end closed; A battery located within said base; Means cooperative with said base and said battery suspending said battery at a distance from the open end of said base; A circular battery terminal contact ring having two planes, a first plane being elevated with reference to a second plane, wherein said ring may be mounted against the base by the use of screws or the like in said second plane, which contacts said inner side of the closed end of said base, and in which the first plane extends at a distance from said mounting screws or the like toward the open end of said base, so that a battery terminal may contact said first plane of the ring without directly contacting said screws; Screws or the like mounting said ring to the said inner side of the closed end of said base, in such manner that one of the terminals of said battery is in contact with said ring; Tubular lamp and lense

holding means fastened flush against the outer surface of said closed end of said tubular base, in immediate relationship to battery terminal contact within said base, in such manner that mounting screws extending from the interior of said base to said lamp and lense holding means perform the added function of holding a lamp within said lamp and lense holding means and providing electrical contact to said lamp; And lense means mounted in each end of said lamp and lense holding means in such manner that a portion of said lamp lense slides within said lamp and lense holding means and is held in position by screws providing for lateral adjustment of the location of each lense as well as providing for distortion of the said lamp and lense holding means to allow drainage of moisture from within said lamp and lense holding means to without the same.

3,857,029

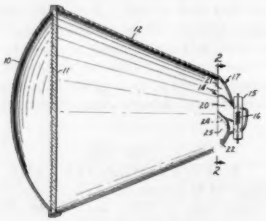
ILLUMINATING DEVICE

Harlan L. Krinke, May Twp., Washington Co., Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 247,960, April 27, 1972, Pat. No. 3,764,797. This application Jan. 26, 1973, Ser. No. 326,825The portion of the term of this patent subsequent to Oct. 9, 1990, has been disclaimed.

Int. Cl. F21m *3/04;* **F21v** *7/00*

U.S. Cl. 240—41.3 **6 Claims**



1. An illuminating device comprising a condensing lens having a focal plane; a reflector having concave areas the surfaces of which have a diffuse reflective coating facing said lens and disposed in said focal plane, and a filament positioned at the focus of said lens.

3,857,030

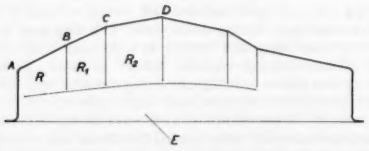
REFLECTOR FOR LIGHT FIXTURES

Marie Henri Hubert Adam, Lorey-par-Bayon, France, assignor to Societe Anonyme L'Eclairage Technique, Meurthe et Moselle, France

Continuation of Ser. No. 233,620, March 10, 1972, abandoned. This application July 19, 1973, Ser. No. 380,596

Int. Cl. F21v *7/12*

U.S. Cl. 240—103 B **1 Claim**



1. A luminaire capable of receiving different light sources whose length along an axis may vary between two known values comprising in combination a reflector having a plurality of juxtaposed reflecting surfaces arranged so that the section of said reflector through a set of planes passing through the axis of the light source is a broken line formed by segments of straight lines, each segment forming with the adjacent segment an obtuse angle, said segments being, in each of said sets of planes chords of the arc of a parabola assuring in each plane of the set a good photometric distribution for the light source of a large dimension, the length of each of said chords being greater than the length of the smaller of the two known values and less than the length of the greater of the two known values.

3,857,031

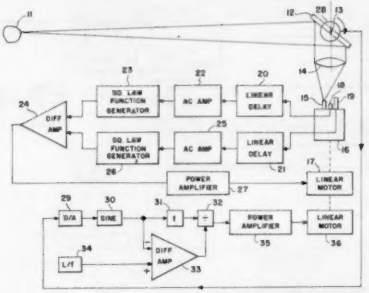
AUTOMATIC FOCUS CONTROL FOR FACSIMILE CAMERAS

Archibald R. Sinclair, Hampton; Ernest E. Burcher, Newport News, and Stephen J. Katzberg, Yorktown, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 15, 1973, Ser. No. 406,715

Int. Cl. G01j *1/20*

U.S. Cl. 250—201 **6 Claims**



1. An automatic focus control for a facsimile camera that includes a scanning means, a lens, a focal plane and an imaging detector for producing electrical signals of the picture elements viewed by the imaging detector comprising:

a movable stage with the imaging detector of said facsimile camera mounted thereon in the focal plane of said facsimile camera;

means including a first photodetector mounted on said movable stage closer to said lens than said imaging detector for producing first electrical signals of the picture elements viewed by the imaging detector and in phase with the electrical signals produced by the imaging detector;

means including a second photodetector mounted on said movable stage farther from said lens than said imaging detector for producing second electrical signals of the picture elements viewed by the imaging detector and in phase with the electrical signals produced by the imaging detector; and

servo means receiving said first and second electrical signals for moving said movable means along a line in the direction of the lens of said facsimile camera so as to maintain said first and second electrical signals equal.

3,857,032

OPTICAL COURSE DATUM HEADING SELECTION TRANSDUCER

Clarence Van Englehoven, Olathe, Kans., assignor to King Radio Corporation, Olathe, Kans.

Filed Mar. 28, 1973, Ser. No. 345,487

Int. Cl. G01d *5/34*

U.S. Cl. 250—231 R **3 Claims**

1. In an avionics system having a compass card and a manu-

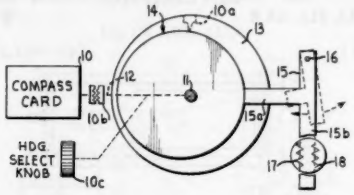
ally movable heading select indicator therein, the improvement comprising

a shutter,

a light source,

a light sensitive detector, said detector having an electrical signal output therefrom,

a cam surface operatively coupled to said compass card said surface contacting said shutter,



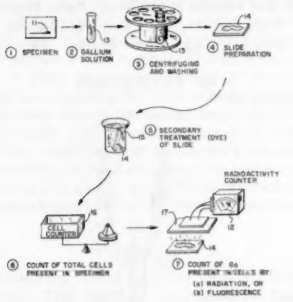
means for moving said cam surface in accordance with the relative angular positions of said heading select indicator and said compass card, and

means for movably mounting and locating said shutter between said light source and said light sensitive detector to thereby preclude at least a portion of said light from impinging on said detector when said shutter occupies a preselected position, said detector signal output corresponding to the angular position of said heading select indicator with respect to said compass card.

3,857,033
DETECTING MALIGNANT CELLS

Carolus M. Cobb, Arlington, Mass., assignor to American Science & Engineering, Inc., Cambridge, Mass.

Filed Apr. 26, 1972, Ser. No. 247,740
Int. Cl. G21h *5/02*
U.S. Cl. 250—303 **27 Claims**


① SPECIMEN
② GALLIUM SOLUTION
③ CENTRIFUGING AND WASHING
④ SLIDE PREPARATION
⑤ SECONDARY TREATMENT OF SLIDE (DYE)
RADIOACTIVITY COUNTER
CELL COUNTER
⑥ COUNT OF TOTAL CELLS PRESENT IN SPECIMEN
⑦ COUNT OF Ga PRESENT IN CELLS BY: (a) RADIATION, OR (b) FLUORESCENCE

1. A method of detecting malignant cells which method includes the steps of gathering a sample of exfoliated cells that may include malignant cells,

placing the cells in a solution containing a gallium compound and allowing the gallium to be absorbed from the solution by the cells,

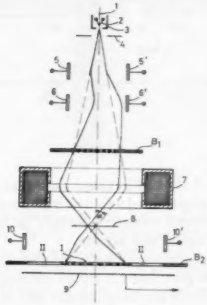
washing out the gallium from the solution except for that absorbed by the cells,

and detecting the gallium in the cells in said solution.

3,857,034
SCANNING CHARGED BEAM PARTICLE BEAM MICROSCOPE

Walter Hoppe, Munich, Germany, assignor to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Gottingen, Germany

Continuation of Ser. No. 161,137, July 9, 1971, abandoned. This application May 7, 1973, Ser. No. 358,080
Claims priority, application Germany, Aug. 31, 1970, 2043749
Int. Cl. H01j *37/26*; **G01n** *23/00*
U.S. Cl. 250—311 **9 Claims**



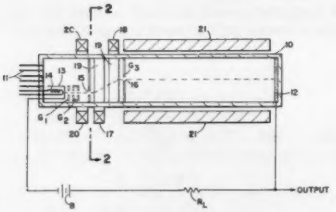
1. A scanning charged particle beam microscope comprising a charged particle beam generator for generating a beam having a radiation cone having a primary longitudinal beam axis extending between said generator and a specimen, a system adjacent said generator for deflecting said beam perpendicular to the axis in accordance with a set of raster coordinates, a charged particle beam optical condenser lens disposed about said axis for focusing the beam into a small spot in the plane of said specimen for scanning thereof, said lens being disposed between said deflecting system and said specimen, a detector arrangement for providing a signal of those portions of the beam which are scattered when the specimen is irradiated, said detector being disposed about the axis under said specimen, and an aperture combination arrangement having dimensions independent of the size of the radiation cone through said condenser lens, said aperture combination comprising a first, input aperture disposed about the beam axis between said deflecting system and said condenser lens, and a second output aperture between said specimen and said detector complementary to said first aperture and having a first inner portion which is radiation opaque with respect to the unscattered portions of the beam complementary to said input aperture and permeable to the scattered portions of the beam and a second outer portion having a portion totally permeable in respect to scattered charged particles, the areas of said first aperture and the complementary areas of the first portion of said second aperture being ring-shaped and concentric, the outer portion of the output aperture having a radial width at least equal to one half of the radius of the inner portion, whereby the ratio between primary radiation intensity and detected scattered radiation is improved for the wide primary radiation cone required for high resolution and least possible radiation loading of the specimen.

3,857,035

INFRARED VIDICON WITH OFF-AXIS ELECTRON GUN

Louis D. Miller, Leola, Pa., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 1, 1973, Ser. No. 411,611
Int. Cl. G01t 1/16
U.S. Cl. 250—338 4 Claims



1. An infrared vidicon having an elongated sealed envelope with a central longitudinal axis and with an electron gun in one end and an infrared sensitive surface in the other end, and electron beam deflection means:

said electron gun including a thermonic cathode, at least one control grid, and having a longitudinal axis parallel to but offset from the longitudinal axis of said envelope,

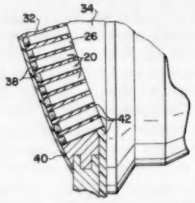
said vidicon further including electron beam bending means including means for deflecting the beam from said gun first toward and then coaxial with the longitudinal axis of said envelope.

3,857,036

ENCAPSULATED SCINTILLATION PHOSPHOR

William P. Novak, 15180 Lake Ave., Middlefield, Ohio 44062

Filed June 1, 1972, Ser. No. 258,521
Int. Cl. G01t 1/20
U.S. Cl. 250—367 8 Claims



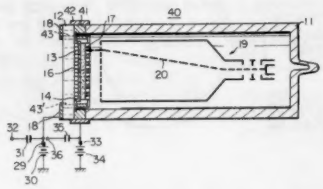
1. An encapsulated radiation detector comprising a shaped scintillation phosphor sensitive to ionizing radiation so as to emit flashes of light upon impingement of said radiation within said phosphor, a reflective foil to provide specular reflection on all surfaces of said crystal except a surface through which said flashes of light are to be essentially, uniformly collected independent of scintillation site, said foil being fixedly disposed upon said surface by means of a shrink-fitted jacket provided by a thermoplastic synthetic resinous material permeable to said ionizing radiation, disposed upon said foil.

3,857,037

COLOR CAMERA TUBE HAVING COLOR STRIP FILTER AND AN INDEX ELECTRODE

Kaoru Tomii, and Hiroshi Miyama, both of Osaka, Japan, assignors to Matsushita Electric Industrial Company Limited, Osaka, Japan

Filed Sept. 29, 1972, Ser. No. 293,515
Claims priority, application Japan, Sept. 29, 1971, 46-76473; May 24, 1972, 47-52029; May 24, 1972, 47-52030; May 24, 1972, 47-52031; May 24, 1972, 47-52032
Int. Cl. H01j 31/26
U.S. Cl. 313—65 R 5 Claims



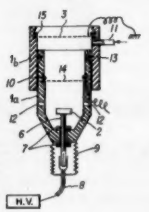
1. In a color television camera tube adapted to be supported within a camera case, the tube having a cylindrical evacuated body, a face plate coupled to said body at one end thereof, a target assembly disposed on one side of said face plate and having a color filter, a photo conductive layer and a pair of index electrodes, the improvement which comprises a pair of electrically conductive studs embedded in said face plate and extending there through, first ends of said studs connected respectively to said index electrodes, the other ends of said studs projecting beyond a surface of said face plate, support members disposed between the camera case and the camera tube for supporting the camera tube body, and a pair of conductive resilient members mounted on said support members and contacting the other ends of said respective studs for electrically coupling said studs with said support members, thereby picking up electrical signals through said studs.

3,857,038

GLOW-TUBE FOR X-RAY SPECTROMETRY WITH DIRECTLY EXCITED SAMPLES

Jean Sahores, Route De Morlaas, France, assignor to Societe Nationale Des Petroles D'Aquitaine, Paris, France

Filed Dec. 26, 1972, Ser. No. 318,198
Claims priority, application France, Dec. 29, 1971, 71.47290
Int. Cl. H01j 39/28
U.S. Cl. 250—374 6 Claims



1. A glow-tube for use in X-ray spectrometry with directly excited samples, said glow-tube comprising at least one elongated insulating casing having an opening in one end thereof and containing a disc-shaped cathode and a grid-shaped anode, said cathode and anode being aligned longitudinally of said casing with said anode between said cathode and opening, said tube being adapted to propagate an electron beam which passes through said opening when said cathode is connected

to a high voltage source and said anode is connected to ground.

3,857,039

X-RAY DEVICE

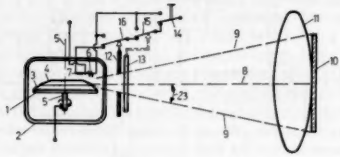
Kurt Franke, Erlangen, and Johann Finkenzeller, Tennenlohe, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 3, 1973, Ser. No. 320,757

Claims priority, application Germany, Jan. 5, 1972, 2200510

Int. Cl. G03b *41/16*

U.S. Cl. 250—402 **1 Claim**



1. An X-ray device, comprising in combination, an X-ray tube of the rotating anode type having a rotatable stem and an anode plate mounted upon said rotatable stem, at least two electron-emitting cathodes spaced from said anode plate, and at least two concentric annular target tracks of different obtuse face angles formed on said anode plate, each of said target tracks being associated to one of said cathodes, a manually operated switch for selecting one of said cathodes to be activated, an X-ray screen for fluoroscopy mounted at a radial distance from the anode in a plane parallel to the axis of revolution of said rotating anode and being adjusted to X-rays emitted from the target tracks in a radial direction rectangular to said axis of revolution, two pairs of adjustable collimator plates mounted between the target tracks and said X-ray screen parallel to said X-ray screen and an automatic switching device comprising at least one changeover switch for said cathodes, actuated by said pair of collimator plates adjustable in a direction parallel to the axis of revolution, said automatic switching device switching on said cathode being associated to the target track having the bigger face angle when the selected adjustment of said pair of collimator plates exceeds a predetermined opening of the radiation beam larger than twice the angle of the surface of said target track having the smaller face angle with a plane normal to the axis of revolution, said switching device switching out said cathode being associated to the target track having the smaller face angle even when it has been manually selected, and wherein said predetermined opening of the radiation beam is effected when the planes of the X-ray emitting areas of the respective target tracks touch the edges of the collimator plates and the opposed edges of the usual film sizes being fixed in the plane of said X-ray screen.

3,857,040

AUTOMATIC FILM PROCESSING MACHINE

Ernst Zwettler, 2101 Hollister Ter., Glendale, Calif. 91206, and Siegmund E. Goebels, 1734 S. Barrington Ave., West Los Angeles, Calif. 90025

Division of Ser. No. 221,228, Jan. 27, 1972,. This application Oct. 15, 1973, Ser. No. 406,541

Int. Cl. G01n *23/04*

U.S. Cl. 250—481 **3 Claims**

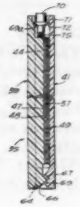
1. An X-ray film cassette for use in a daylight processor having an entrance slot with side abutments therein, the combination comprising:

a first vertically disposed rectangular cover having a well formed on the inner central portion thereof and having longitudinal sides,

a second vertically disposed opposing rectangular cover having a complementary land formed on the inner central portion thereof for fitting in the well of the first cover and having longitudinal marginal sidewalls for slideably extending over the longitudinal sides of said first cover to exclude passage of outside light into the interior of said cassette,

a pair of vertically spaced transverse angular projecting portions on the inner lower surface of one of said covers, the region between the peaks of said pair of angular projecting portions forming a transverse angular receding portion,

a single transverse angular projecting portion on the inner lower surface of the other of said covers, and



spring biased fasteners on the longitudinal sides of said cassette for resiliently holding the inner central portions of said covers together to accomodate a film therebetween with the transverse angular receding portion on the inner lower surface of said one cover mating with the single transverse angular projecting portion on the inner lower surface of the other cover, and

means on either side of the bottom of said cassette operable upon the seating of said means against the abutments on the sides of the entrance slot of said processor to separate said covers against the action of said spring biased fastners to enable the film to drop out of said cassette past the peaks of the angular projecting portions on the respective covers into said processor.

3,857,041

ELECTRON BEAM PATTERNING SYSTEM FOR USE IN PRODUCTION OF SEMICONDUCTOR DEVICES

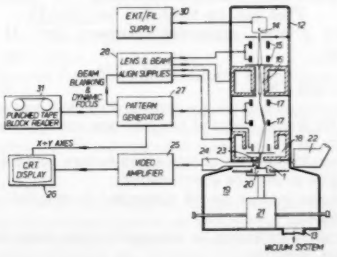
Denis Frank Spicer, Putnoe, Bedford, England, assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 51,257, June 30, 1970. This application Nov. 13, 1972, Ser. No. 306,069

Claims priority, application Great Britain, July 3, 1969, 33555/69

Int. Cl. B23k *5/00*

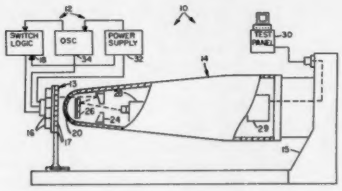
U.S. Cl. 250—492 **4 Claims**



1. A system for aligning a semiconductor slice having a selectively positioned reference alignment pattern and an

electron-sensitive film thereon, by consecutively exposing a plurality of patterns in said electron-sensitive film, comprising:
a. means for generating an electron beam focused on said film
b. electron beam deflection control means for sequentially step scanning the electron beam in an uninterrupted sequence over said electron-sensitive film in a pattern corresponding with said reference alignment pattern;
c. means responsive to said scanning of the electron beam to generate positional data signals corresponding to said scanned pattern and said alignment marker pattern;
d. means responsive to said positional data signals to generate error data indicating positional errors of said scanned patterns relative to said alignment marker pattern for enabling the said scanned patterns and said alignment marker pattern to be brought into alignment.

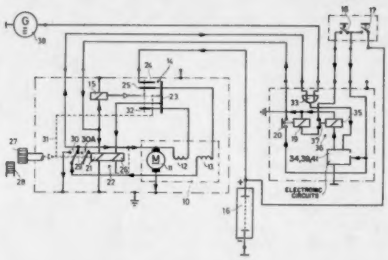
3,857,042
LASER SEEKER TEST SET
Don E. LaGrange, Los Angeles; Edward J. Davis, China Lake; Eugene R. Sheer, Ridgecrest; Ralph E. Brewer, Ridgecrest, and Curtis A. Hamilton, Ridgecrest, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Oct. 26, 1973, Ser. No. 409,996
Int. Cl. G21h *5/00*
U.S. Cl. 250—495 **8 Claims**



1. Target simulating apparatus for investigating operational efficiency of a light energy sensitive tracking system having a finite viewing envelope;
said target simulating apparatus including;
a plurality of illuminable elements arranged to emit radiant energy waves toward said tracking system within the viewing envelope of said system;
means for individually illuminating selected ones of said elements; and
means for illuminating said elements in timed sequence.

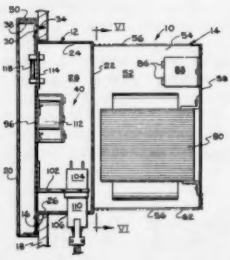
3,857,043
INTERLOCK CIRCUIT FOR BLOCKING OPERATION OF STARTER MOTOR OF A COMBUSTION ENGINE
Ahmed Habasch, Schwieberdingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany
Filed Jan. 15, 1973, Ser. No. 323,719
Claims priority, application Germany, Feb. 21, 1972, 2208045
Int. Cl. F02n *17/00*
U.S. Cl. 290—38 **15 Claims**

1. An interlock system for cutting off or blocking the operation of the starter motor of a combustion engine, comprising:
a battery;
a generator (**38**) for charging said battery coupled to said engine so as to be driven thereby;
an engine ignition switch connected to one pole of said battery;
a starter motor having an armature winding and at least one stator winding;
a manual starter switch connectable to said battery through said engine ignition switch and connected in circuit with said starter motor;
an electrically controlled starter switch means (**14, 15**) in circuit with said starter motor and said starter switch, and means for blocking operation of said electrically controlled starter switch means in response to voltage generated in a winding of said starter motor (**10**) by the revolution of said armature of said starter motor (**10**) when said starter motor is running and to the voltage generated by the revolution of the rotor of said generator (**38**) when said starter motor is quiescent, said blocking means including OR-gate means having one input responsive to



said voltage generated by revolution of said armature of said starter motor while said starter motor is energized, threshold switch means responsive to said OR-gate means, circuit breaker means for breaking the operating circuit of said electrically controlled starter switch means and circuit means interconnecting said threshold switch means and said circuit breaker means and having delay means for prolonging operation of said circuit breaker means for a predetermined interval after return of said threshold switch means to its quiescent condition.

3,857,044
COMBINATION POWER CONVERTER-DISTRIBUTION PANEL UNIT FOR RECREATIONAL VEHICLES
Michael S. Papoi, Kalamazoo, and Max E. Barritt, Marshall, both of Mich., assignors to Progressive Dynamics, Inc., Marshall, Mich.
Filed Aug. 2, 1973, Ser. No. 385,103
Int. Cl. H02b *1/08*
U.S. Cl. 307—9 **5 Claims**



1. A combination distribution panel and power converter unit for recreational vehicles including AC and DC distribution circuits and power converter apparatus characterized by the ability of the unit to separate heat generating components from distribution components and permit access to the distribution circuits from within the vehicle interior and provide access to the power converter apparatus exteriorly from the vehicle interior comprising, in combination, a housing including a distribution portion and a power converter portion, said distribution portion including a primary partition, front ex-

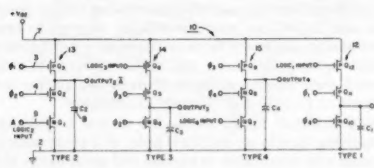
tending sidewalls depending from said partition having flanged edges for mounting said housing within a vertical wall, said partition and sidewalls defining an electrical distribution apparatus receiving chamber, an AC circuit breaker mounted within said chamber having input terminals and output terminals, a DC distribution system within said chamber spaced from said circuit breaker having a supply conductor nd output conductors, receptacles mounted on said housing distribution portion respectively connected to said output terminals and said supply and ouput conductors, said power converter portion including rear extending sidewalls extending from said primary partition in the opposite direction therefrom with respect to said front extending sidewalls, a rear wall interconnecting said rear extending sidewalls in spaced relationship to said partition wherein said partition, rear extending sidewalls and rear wall define a power converter receiving chamber, a voltage reducing power converter transformer circuit within said power converter receiving chamber having a DC low voltage output, an electrical conductor connecting said low voltage output to said receptacles connected to said DC distribution system supply conductor, cover plate means mounted on said flanged edges disposed over said electrical distribution apparatus receiving chamber, an opening defined in said cover plate means providing access to said AC circuit breaker, and a door mounted upon said housing adjacent said flanged edges positional between open and closed positions selectively providing access to said housing distribution portion.

3,857,045

FOUR-PHASE LOGIC SYSTEMS

George M. Low, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Howard L. Petersen, 13192 Paramount Drive, Saratoga, and Donald K. Kinell, 2420 Whitney Drive, Mountain View, both of Calif.

Filed Apr. 17, 1973, Ser. No. 351,929
Int. Cl. H03k *3/64*
U.S. Cl. 307—208 **3 Claims**



1. A four-phase logic system comprising:

at least four logic networks connected in parallel between a voltage source and a reference potential;

each said logic network including a pair of CMOSTS, and a logic MOST circuit connected in series with the pair of CMOSTS, and wherein each said pair comprises a P type conductivity transistor and an N type conductivity transistor with their conductive paths in series connection adjacent series CMOST pairs and logic MOSTS alternating in position in said series between said voltage source and said reference potential,

a four-phase clock generator adapted to generate a four-phase clock waveform signal from a single phase input clock waveform signal,

each said CMOST in each pair of CMOSTS being respectively coupled to adjacent phases of said clock generator which turns it ON and OFF.

each said logic MOST circuit being responsive to a logic input signal, and

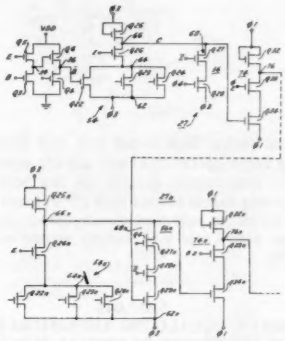
each junction terminal between each pair of CMOSTS constituting an output terminal for its associated logic network with the stray capacitance between said junction terminal and the reference potential constituting a storage means for storing the desired logic output of said associated logic network where it is available for readout from said output terminal.

3,857,046

SHIFT REGISTER-DECODER CIRCUIT FOR ADDRESSING PERMANENT STORAGE MEMORY

Andrew G. Varadibriarwood; Richard B. Rubinstein, both of New York, N.Y., and Steven Radoff, Nashua, N.H., assignors to General Instrument Corporation, Newark, N.J.

Division of Ser. No. 86,882, Nov. 4, 1970, Pat. No. 3,691,534.
This application May 8, 1972, Ser. No. 251,525
Int. Cl. G11c *11/00*
U.S. Cl. 307—221 R **2 Claims**



1. A shift register circuit comprising a plurality of shift register stages each operably connected to a source of timed signals, a plurality of logic stages each having a logic terminal and receiving a set of input signals different from said timed signals which are effective to establish a unique condition at one of said logic stages and to establish a unique signal level at a corresponding one of said logic terminals, a plurality of nodes, means actuatable by an enabling signal and effective when actuated to respectively operatively connect each of said logic terminals to said nodes thereby to establish a unique logic level at one of said nodes so connected to said one of said logic terminals, and effective in the subsequent absence of said enabling signal to disconnect said logic terminals from said nodes and to operatively connect said register stages to said nodes and thereafter to sequentially transfer said unique logic level from said one of said nodes to a succeeding one of said nodes during subsequent one of said timed signals.

3,857,047

DETECTOR EMPLOYING A CURRENT MIRROR

Mark Berwyn Knight, North Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 8, 1973, Ser. No. 368,176
Int. Cl. H03k *9/02*; **H03d** *1/18*
U.S. Cl. 307—231 **16 Claims**

1. A detector for amplitude modulated input signals comprising:

current source means for producing an operating current;

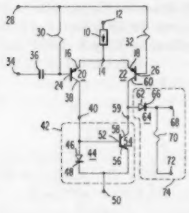
current divider means for dividing said operating current into first and second paths and proportioning the current therebetween in response to said amplitude modulated input signal;

a circuit node for receiving the second path current;

a current mirror having an input terminal for receiving the first path current, a common terminal for receiving a reference potential, and an output terminal connected to said node; and

diode means and load means connected in series between said node and said common terminal, said diode means

for causing said current mirror to saturate and clamp said node to said common terminal at a saturation voltage level characteristic of said current mirror when said first path current exceeds said second path current, said diode means further providing an offsetting potential drop when said mirror is saturated for minimizing saturation voltage



induced current flow to said load, said diode means enabling linear operation of said current mirror when the second path current exceeds the first path current by conducting excess second path current, not received by said mirror, to said load thereby producing an output voltage across said load linearly related to said excess current.

3,857,048

AUTOMATIC EQUALIZING AMPLIFIERS FOR THE TRANSMISSION OF DIGITAL SIGNALS

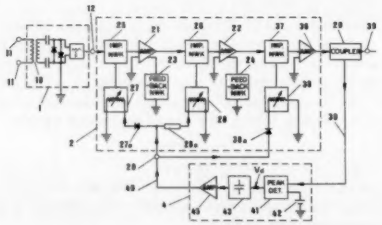
Patrick de Lange de Meux, Saint-Germain-en-Laye, and Claude Gourdon, Perros Guirec, both of France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris, France

Filed Oct. 15, 1973, Ser. No. 406,479

Claims priority, application France, July 20, 1973, 73.26677

Int. Cl. H03k *1/14*; **H03q** *11/04*; **H04b** *3/04*

U.S. Cl. 307—264 **7 Claims**



1. An equalizing amplifier for digital signals, comprising at least two partial amplifiers cascade-connected with at least two variable compensating linear networks, the attenuation and frequency distortion of which are controlled by a direct-current control signal proportional to the difference between the means value of the peak amplitude of the output signal of said equalizing amplifier and a fixed reference voltage, in which each one of said networks includes a variable resistor the value of which is controlled by said control signal, said equalizing amplifier being further characterized in that said control signal is applied to at least part of said networks through at least one semiconductor diode threshold device in the direct conduction direction having its threshold level individually selected for each one of the networks of said part of said networks.

3,857,049

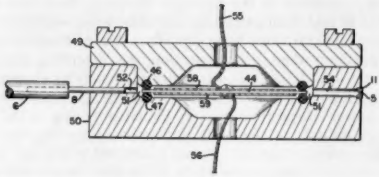
PULSED DROPLET EJECTING SYSTEM

Steven I. Zoltan, Shaker Heights, Ohio, assignor to Gould Inc., Chicago, Ill.

Division of Ser. No. 260,013, June 5, 1972, , which is a division of Ser. No. 70,838, Sept. 9, 1970, Pat. No. 3,683,212. This application Oct. 12, 1973, Ser. No. 405,759

Int. Cl. H04r *17/00*

U.S. Cl. 310—8.1 **2 Claims**



1. A system adapted upon pulsing to expel a small quantity or a succession of small quantities of liquid in controlled manner, comprising:

a reservoir containing said liquid;

a conduit connected to said reservoir and communicating with the liquid therein and filled with said liquid under small or zero static pressure, said conduit having an exit orifice which is sufficiently small that surface tension in the absence of pulsing prevents said liquid from flowing therefrom;

a platelike piezoelectric transducer having two opposed major faces, and housing means sealed around the periphery of said transducer, said housing means forming a portion of said conduit with said ceramic transducer therein coupled to said liquid substantially only at the periphery of said transducer, substantially the full areas of said major faces of said transducer being free of coupling to said liquid, said transducer being adapted to expand parallel to said major faces to displace a small quantity of said liquids overcoming said surface tension to expel a small quantity of said liquid through said orifice and to contract prior to a subsequent expansion;

electrical circuit means connected to said transducer for applying thereto an electrical pulse of a given polarity to cause said transducer to expand and upon decay of said pulse to allow said transducer to contract;

said conduit during operation of said system at all times being open from said reservoir to said orifice whereby the liquid within said housing is replaced by liquid from said reservoir to make up for said expelled liquid upon termination of said pulse.

3,857,050

MAGNETIC DECELERATOR FOR PROJECTILES AND SYSTEM OF DECELERATION AND RECOVERY THEREOF

Fred T. Harris, Rockville, Md., and Edwin L. Resler, Jr., Ithaca, N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

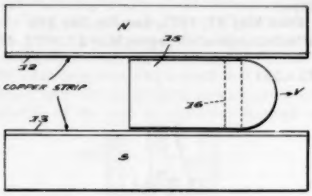
Filed June 4, 1971, Ser. No. 149,965

Int. Cl. H02k *49/00*

U.S. Cl. 310—13 **4 Claims**

1. In a system for decelerating a projectile moving along a path at a given velocity, in combination, a magnetic-permeable slug carried by said projectile; means for generating a magnetic field in a substantially transverse direction to said path, said means including north and south pole pieces having substantially planar parallel surfaces disposed on opposite sides of said path; and conductive facing means on said

planar surfaces for producing a decelerating force on said projectile in response to ring currents induced in said conductive facings due to the interaction of said magnetic field and said slug passing therethrough.

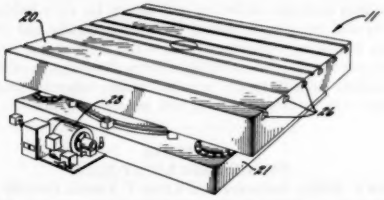


3,857,051

ROTARY POSITION TRANSDUCER ASSEMBLY USING HYDROSTATIC BEARINGS

Daniel J. Seichter, New Holstein, and Orville W. Ehrhardt, Fond Du Lac, both of Wis., assignors to Giddings & Lewis, Inc., Fond du Lac, Wis.

Filed Aug. 30, 1973, Ser. No. 392,959
Int. Cl. H02k *33/00*
U.S. Cl. 310—36 **7 Claims**



1. A transducer for indicating the rotary position of a rotatable member relative to a base upon which said member is mounted, comprising

a stationary support within said base,

a stator plate secured to said stationary support,

a rotor having a plate positioned in closely spaced relation with said stator plate, said rotor being formed with an outer cylindrical support surface and outwardly extending annular surfaces at opposite ends thereof,

hydrostatic bearing means associated with said stationary support for supporting said rotor for friction-free rotational movement with respect to said support, said hydrostatic bearing means including a radial hydrostatic bearing for supporting said cylindrical rotor surface and a hydrostatic thrust bearing for supporting each of said annular surfaces,

means coupling said rotor to said member for rotational movement with said member,

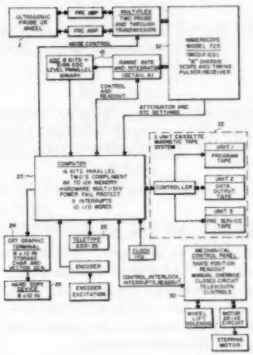
and electrical control means consisting of a first series of electrical conductors mounted on said stator plate and a second series of electrical conductors mounted on said rotor plate in closely spaced relation to said first series for indicating the rotational position of said rotor plate relative to said stator plate.

3,857,052

INSPECTION AND ANALYSIS SYSTEM

Laurence S. Beller, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 28, 1972, Ser. No. 248,466
Int. Cl. G01n *24/04*
U.S. Cl. 340—149 R **4 Claims**



1. A method for performing repetitive comparative inspection of volume elements of a wall comprising the steps of:

mounting an ultrasonic sensor on said wall,

moving said sensor to successive positions along a predetermined inspection path on said wall to obtain inspection data of volume elements of said wall at each said position, said data being obtained in analog form and converted to digital form,

recording said digital inspection data pertaining to each of said positions in an electronic memory for subsequent electronic readout as comparison data,

performing a subsequent inspection of said wall by again mounting said sensor on said wall and moving said sensor to said previously inspected positions along said predetermined inspection path to obtain subsequent inspection data at each of said positions, said subsequent inspection data being obtained in analog form from said sensor and converted to digital form,

automatically and electronically obtaining from said memory in real time a readout of said comparison data of each corresponding position along said predetermined inspection path during said subsequent inspection,

automatically and electronically comparing in real time said comparison data pertaining to each position along said predetermined inspection path with said subsequent inspection data, and

displaying a signal indicative of any significant difference between said subsequent inspection data and said comparison data for each said position along said predetermined inspection path, thereby providing an indication of any change in the condition of volume elements of said wall at any inspected position.

3,857,053
SYNCHRONOUS MOTOR STATOR POLE ARRANGEMENT

Kenji Yatsushiro, Chicago, and George F. Kuchuris, Bloomingdale, both of Ill., assignors to Controls Company of America, Schiller Park, Ill.

Filed Apr. 9, 1973, Ser. No. 348,916
Int. Cl. H02k 21/14
U.S. Cl. 310—162 9 Claims

1. A synchronous motor comprising

a first case part having a group of poles lanced therefrom and formed to lie concentric with an axis,

a second case part having a group of poles lanced therefrom and formed to lie concentric with said axis,

said case parts being magnetically connected and defining with said poles an annular space,

a coil in said space and arranged to induce magnetic fields of alternating polarity in each of said groups when energized with alternating current,

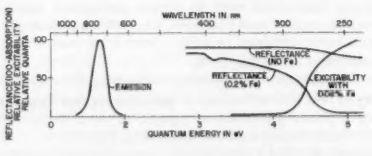
the poles of one group being arranged relative to the poles of the other group so that alternate working air gaps are unequal and the air gaps of equal size are equally spaced, and a rotor mounted for rotation on said axis and having a multiplicity of poles of alternate polarity on its periphery,

each stator pole embracing more than one rotor pole.

3,857,054
DISCHARGE DEVICE AND METHOD FOR GENERATING NEAR INFRARED RADIATIONS

Willi Lehmann, Murrysville, Pa., and Anselm Wachtel, Parlin, N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 11, 1973, Ser. No. 378,286
Int. Cl. H01j 1/62
U.S. Cl. 313—109 8 Claims

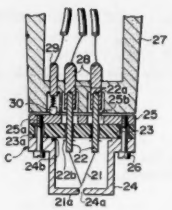


1. The method of converting short wavelength ultraviolet radiations into near infrared radiations while minimizing the generation of visible radiations, which method comprises, irradiating with short wavelength ultraviolet radiations a phosphor consisting essentially of an $LiAlO_2$ matrix activated by from 0.001 to 0.02 gram atom of iron per gram mole of said matrix to provide infra-red radiations having an emission peaked at approximately 740 n.m.

3,857,055
ELECTRON GUN FOR ELECTRON IRRADIATION EQUIPMENT

Shogo Shirai, Yokohama, and Haruo Uchida, Tokyo, both of Japan, assignors to Kabushiki Kaisha Akashi Seisakusho, Tokyo, Japan

Filed May 17, 1973, Ser. No. 361,180
Claims priority, application Japan, May 22, 1972, 47-50587
Int. Cl. H01j 1/00
U.S. Cl. 313—237 8 Claims

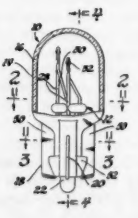


1. An electron gun for use in electron irradiation equipment, said electron gun comprising: a cartridge comprising a filament having two plug terminals receptive of an electric potential applied thereto during use, a main electrode receptive of an electric potential applied thereto during use for focusing electrons emitted by said filament, and mounting means having a major surface, said filament and said main electrode being disposed on said major surface and relatively positioned to effect focusing by said main electrode of the electrons emitted by said filament; and means for removably mounting said cartridge including supply terminal means for supplying electric potential to said main electrode and said two plug terminals including jack means for detachably coupling said two plug terminals both mechanically and electrically to said supply terminal means and means separate from said jack means for detachably, electrically coupling said main electrode to said supply terminal means whereby said cartridge may be detached from said mounting means.

3,857,056
WEDGE BASE LIGHT BULB

John S. Miller, Anderson, and Lloyd T. Fuqua, Portville, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 26, 1973, Ser. No. 410,016
Int. Cl. H01j 5/48, 5/50
U.S. Cl. 313—318 2 Claims



1. A wedge base light bulb formed from only two pieces of cylindrical glass tubing, comprising: an exhaust tube formed of one piece of glass tubing having a flange at one end including a plurality of axial slots therein; filament support legs axially positioned along the exhaust tube and projecting therebeyond, said support legs being retained at said slots by melting the adjacent material therearound; filament means connected

between the upper ends of said support legs; an outer glass enclosure formed of said other piece of glass tubing including a closed upper end encircling said filament means, said support legs and said flange of said exhaust tube, and a lower base fusion sealed about the lower portions of the support legs and the exhaust tube; a plurality of ribs formed on the outer surface of the base adapted to be frictionally received in a wedge base bulb socket, the lower ends of the support legs being formed along the base of the ribs for making electrical contact with the socket terminals; and a pinch seal at the lower end of said exhaust tube for maintaining an evacuated environment in the interior of the bulb as evacuated through said central passage.

3,857,057

COLOUR TELEVISION DISPLAY APPARATUS PROVIDED WITH A PICTURE DISPLAY TUBE WITH ELECTRON BEAMS GENERATED IN ONE PLANE

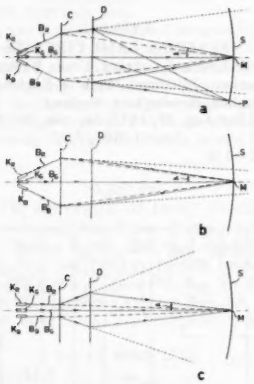
Piet Gerard Joseph Barten, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 15, 1972, Ser. No. 315,681

Claims priority, application Netherlands, Dec. 22, 1971, 7117623

Int. Cl. H01j *29/76;* **H04n** *3/16*

U.S. Cl. 313—412 **14 Claims**



1. Colour television display apparatus provided with a picture display tube having a display screen, and with a system of deflection coils comprising a magnetic core for deflecting electron beams into two substantially orthogonal directions, which beams are generated substantially in one plane in the tube, characterized in that the landing spots of the electron beams on the display screen are registered by a statically energized magnetic quadripolar field generated at the area of the deflection plane, while there is no point of intersection of the beams located within the display tube in the absence of said quadripolar field.

3,857,058

ELECTRODE SUPPORT STRAP

Paul Lavern Nestleroth, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed July 11, 1973, Ser. No. 378,178

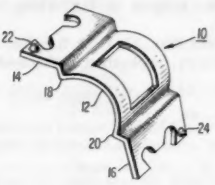
Int. Cl. H01j *29/50, 29/02*

U.S. Cl. 313—417 **8 Claims**

1. An electrode strap for use in an electron gun comprising:

a first portion for receiving and attachment to an electrode of said electron gun, and

at least one second portion extending from said first portion adapted for attachment to a support, said second portion having a pointed protrusion from a surface thereof for



providing a single point contact with an adjacent strap of similar design in an assembled gun.

3,857,059

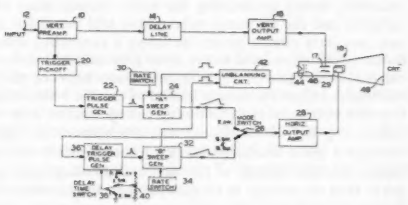
OSCILLOSCOPE SWEEP SYSTEM WITH TWO SWEEP GENERATORS HAVING SPEED RATE SWITCHES AND SWEEP MODE SWITCHES OPERATED BY A CONTROL KNOB

Lester L. Larson, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 126,084, March 19, 1971, abandoned. This application June 1, 1973, Ser. No. 365,875

Int. Cl. H01j *29/70*

U.S. Cl. 315—391 **3 Claims**



1. In an oscilloscope having a pair of sweep generating circuits for operation in normal, intensified, and delayed sweep modes, a switch apparatus which comprises:

a first switch for changing the rates of sweep signals produced by one of said pair of sweep generator circuits, said first switch being a rotary switch and said one of said pair of sweep generator circuits being a normal sweep generator circuit;

a second switch for changing the rates of sweep signals produced by the other of said pair of sweep generator circuits, said second switch being a rotary switch and said other of said pair of sweep generator circuits being a delayed sweep generator circuit;

a third switch for selectively connecting the outputs of said pair of sweep generator circuits to a beam deflection means of a cathode ray tube in said oscilloscope; and

switch control means including a tubular outer shaft connected to said second switch and extending through said outer shaft to a single knob which is attached to said inner shaft for rotation thereof and for moving said inner shaft longitudinally between two positions for selectively operating said first and second switches, said inner shaft being coupled to said third switch for operation thereof in response to longitudinal movement of said inner shaft between said two positions;

said switch control means also including coupling means for selectively engaging said first switch with said second switch to provide ganged operation thereof or disengaging said first switch to provide independent operation of said second switch.

3,857,060
GLOW DISCHARGE TUBE IGNITION CIRCUIT FOR ELECTRIC DISCHARGE TUBE

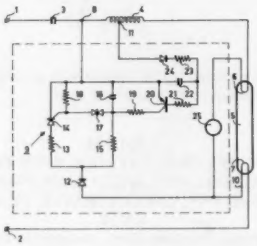
Hubertus Mathias Jozef Chermin, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 12, 1973, Ser. No. 340,052

Claims priority, application Netherlands, Mar. 17, 1972, 7203554

Int. Cl. H05b *41/18*

U.S. Cl. 315—99 **15 Claims**



1. An arrangement for starting and operating an electric discharge tube having two electrodes comprising, two input terminals adapted to be connected to an alternating voltage source, the cold ignition voltage of the discharge tube being higher than the voltage of the alternating voltage source, an inductor, means connecting the series arrangement of the inductor and the discharge tube across said two input terminals, auxiliary circuit means including a controlled semiconductor rectifier coupled to the input terminals and to the tube electrodes for generating ignition voltage between the tube electrodes before the tube is ignited of a value which is higher than the voltage of the alternating voltage source, and means connecting the electrodes of the discharge tube together through a glow discharge starter whose ignition voltage is higher than the voltage of the alternating voltage source and lower than the voltage to be generated by the auxiliary circuit means.

3,857,061
SAFETY CIRCUIT FOR THE DETECTION OF THE SIMULTANEOUS ACTUATION OF TWO ANTAGONIZING UNITS

Robert Boudault, Limours, and Christian Guion, Verrieres Le Buisson, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

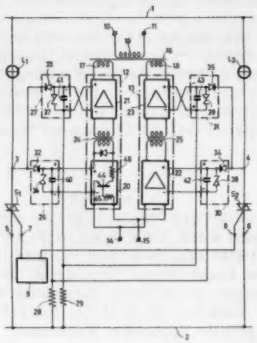
Filed Nov. 9, 1973, Ser. No. 414,377

Claims priority, application France, Nov. 15, 1972, 72.40508

Int. Cl. H01j *7/42*

U.S. Cl. 315—130 **2 Claims**

1. A safety circuit for the detection of the simultaneous actuation of two antagonizing units, each of which is supplied with an alternating voltage via a static switch, said safety circuit supplying an approval signal if no supply voltage is simultaneously applied to the antagonizing units, characterized in that it comprises two amplification channels which receive an approval signal of a given frequency, the outputs thereof being coupled to the output of the safety circuit, each amplification channel comprising a cascade-connection of two amplifiers, the direct current supply for these two amplification channels being provided for one of the amplification channels by a pair of supply circuits which are each connected to the terminals of the switch which controls one of the antagonizing units, and for the other amplification channel by another pair of supply circuits, each of which is connected to the terminals of the switch which controls the other antagonizing unit, both supply circuits of each pair comprising a rectifier which is arranged in one supply circuit so as to rectify the positive half-cycles of the alternating voltage and in the other



supply circuit so as to rectify the negative half-cycles, these two supply circuits supplying the one and the other amplifier of the amplification channel, respectively.

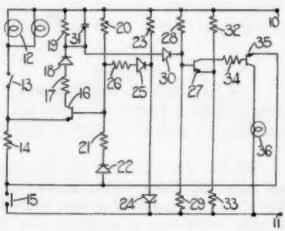
3,857,062
FLASHING LAMP CIRCUITS

Gordon Harris Leonard, Gerrards Cross, Bucks., and Anthony John Ramshaw, Middlesex, both of England, assignors to C.A.V. Limited, Birmingham, England

Filed Aug. 27, 1973, Ser. No. 391,768

Int. Cl. H01j *7/42*

U.S. Cl. 315—136 **3 Claims**



1. A flashing lamp circuit comprising a pair of supply terminals, contact means connected in series with the lamp to be flashed, a resistor connected in series with said lamp and across which when said contact means is closed is developed a voltage indicative of the current flow through said lamp, a warning lamp, a transistor switch including a transistor having its collector emitter path connected in series with said warning lamp across said contact means, said transistor switch being operable to cause illumination of said warning lamp when said contact means is open, voltage sensing means for sensing the voltage developed across said resistor, a capacitor associated with said voltage sensing means, said voltage sensing means establishing a charging path for said capacitor in the event that the voltage across said resistor falls below a predetermined value when the contact means is closed, the voltage across said capacitor acting to prevent conduction of said transistor when said contact means is next opened and thereby preventing illumination of the warning lamp.

3,857,063

BALLAST CIRCUITS FOR DISCHARGE LAMPS

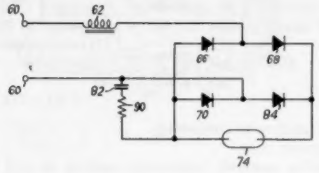
Peter Colin Major, and Kenneth Whittier Ogden, both of London, England, assignors to Thorn Electrical Industries Limited, London, England

Filed Feb. 15, 1973, Ser. No. 332,717

Claims priority, application Great Britain, Feb. 16, 1972, 7257/72

Int. Cl. H05b *41/23*

U.S. Cl. 315—170 **4 Claims**



1. A transformerless ballast circuit for a metal halide discharge lamp, comprising:

two input terminals for connection to an a.c. source of supply;

two output terminals for supplying direct current to the metal halide discharge lamp;

a bridge rectifier coupling said two input terminals and said two output terminals; and

a capacitor and resistor connected in series circuit in parallel with said bridge circuit and coupling one of said input terminals and one of said output terminals, said series circuit presenting a sufficiently high capacitance to be effective during starting of said discharge lamp and a sufficiently high impedance to be substantially ineffective during run-up and normal running of said lamp.

3,857,064

AUTOMATIC CONTROL OF LIGHT FLASH PULSES

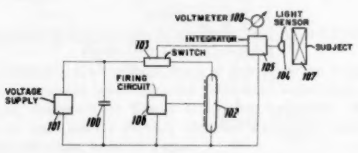
Zoltan Vital, Uccle, and Jean Orban, Clabecq, both of Belgium, assignors to Ponder & Best, Inc., Los Angeles, Calif.

Continuation of Ser. No. 799,554, Feb. 13, 1969, abandoned. This application Apr. 14, 1972, Ser. No. 244,279

Claims priority, application Belgium, Feb. 13, 1968, 54471; Nov. 21, 1968, 66425; Dec. 27, 1968, 68017; Jan. 20, 1969, 68982

Int. Cl. H05b *37/02*

U.S. Cl. 315—241 P **23 Claims**



1. In a device for controlling the operation of an element which converts an electric current into a light flash and including a storage capacitor storing energy for supplying the element, a light sensor arranged for sensing light produced by the element and reflected from an object and for producing an electrical output proportional to the intensity of the light which it receives, and an integrator connected to receive the output from the sensor and to produce a control signal representing the time integral of the received light intensity, the improvement comprising an electronic switch having two main electrodes via which said switch is connected in series between said capacitor and said element, and having a control electrode connected to said integrator to receive the control signal from said integrator, the application of the control signal to said control electrode rendering said switch nonconductive and thus opening the circuit between said capacitor and said element and halting the discharge of said capacitor for generally conserving energy from said capacitor when the control signal from said integrator reaches a predetermined value.

3,857,065

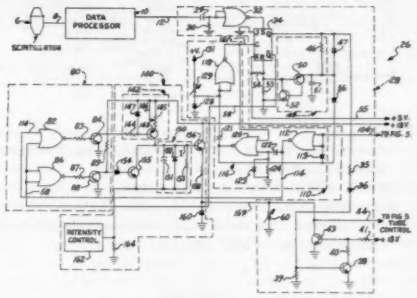
GAS-FILLED TUBE CONTROL APPARATUS AND METHOD

Arthur H. Hutchison, and Lonnie S. McMillian, both of Huntsville, Ala., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Feb. 22, 1972, Ser. No. 228,174

Int. Cl. H05b *37/00*

U.S. Cl. 315—340 **25 Claims**



1. In a system comprising a gas-filled tube that produces light by conducting current after a predetermined voltage is applied across the tube, improved apparatus for maintaining the light intensity at a predetermined value comprising:

control means for applying the predetermined voltage across the tube at a predetermined time and for controlling the amount of current flowing through the tube in response to a control signal;

first means for generating a first operating signal in response the predetermined voltage applied across the tube;

second means for generating a second operating signal in response to the current flowing through the tube;

generating means for generating a first control signal monotonically varying in a first direction in response to the first operating signal, for terminating the generation of said first control signal in response to the second operating signal and for generating a second control signal monotonically varying in a second direction in response to the second operating signal; and

means for transmitting the first and second control signals to the control means, whereby the initial amount of current flow through the tube is proportional to the length of time between the application of voltage across the tube and the commencement of current conduction through the tube and wherein the current flow through the tube decreases subsequent to the initial current flow so that the intensity of light produced by the tube remains substantially constant.

3,857,066

ELECTROSTATIC CHARGE SENSING PROBE

Jay D. Cline, and Don S. Grant, both of Fort Lauderdale, Fla., assignors to Dayton Aircraft Products, Inc., Fort Lauderdale, Fla.

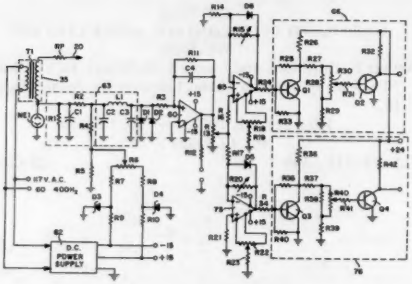
Filed July 6, 1973, Ser. No. 377,060

Int. Cl. H05f *3/06*

U.S. Cl. 317—2 R **7 Claims**

1. Apparatus for discharging an electrostatic charge accumulated on a body, said apparatus including

a probe extending from said body into the atmosphere,
a high voltage sensor power supply connected between said probe and said body, said sensor power supply having an output voltage of sufficient magnitude to cause current to flow through said probe to the atmosphere,



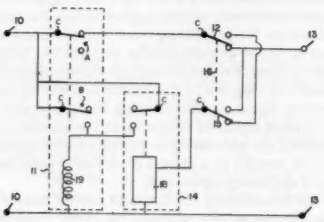
sensing means for sensing the magnitude and polarity of said current flow in said probe as an indication of an electrostatic charge on said body,
separate electrostatic discharge means, and
means responsive to said sensing means for controlling the operation of said electrostatic discharge means to neutralize the electrostatic charge.

3,857,067

SWITCH FAILURE MONITORING DEVICE

Mohammed H. Zanboorie, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Department of Health Education and Welfare, Washington, D.C.

Filed Dec. 13, 1972, Ser. No. 314,508
Int. Cl. H02h *3/00*
U.S. Cl. 317—9 A **5 Claims**



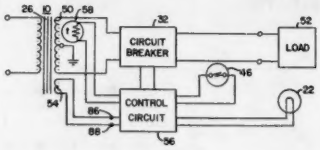
1. An electrical circuit for deenergizing a load device in case of improper functioning in microwave ovens and cabinet radiographic units comprising:
an operating circuit;
a monitoring circuit connected to the operating circuit;
first means in the operating circuit for removing potential therefrom;
first switch means in the operating circuit for applying potential to a load device, said first means being a power relay connected in series with said first switch;
second switch means in the monitoring circuit; and
time delay means in the monitoring circuit connected between the second switch and the power relay and arranged to energize the first means should either the first or second switches fail to function or should one of said switches be activated prematurely irrespective of whether a continuity through the load is maintained.

3,857,068

TRANSFORMER HAVING A THYRISTOR CONTROLLED CIRCUIT BREAKER

Harry R. Braunstein, Athens, Ga., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 26, 1973, Ser. No. 401,095
Int. Cl. H02h *7/04*
U.S. Cl. 317—15 **12 Claims**



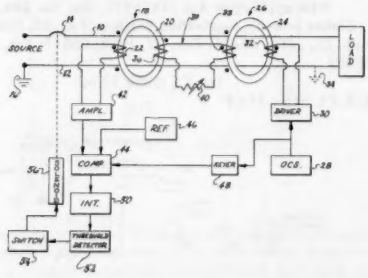
1. A transformer comprising:
a magnetic core;
a winding assembly inductively coupled to said magnetic core;
a circuit breaker capable of interrupting power supplied by the transformer;
electrical heat sensing means which is responsive to the temperature of said winding assembly;
electrical control means which is responsive to said heat sensing means; and
electromechanical tripping means which trips said circuit breaker when the temperature sensed by said heat sensing means exceeds a first predetermined value, said tripping means being activated by an electrical signal from said control means.

3,857,069

GROUND FAULT CIRCUIT INTERRUPTER AND MODULE THEREFOR

Edward Keith Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed Dec. 20, 1973, Ser. No. 426,496
Int. Cl. H02h *3/28*
U.S. Cl. 317—18 D **15 Claims**



1. A ground fault circuit interrupter comprising, in combination:
A. circuit interrupter contacts for connection in the line side of a power distribution circuit including a line conductor and a neutral conductor grounded at the power source;
B. means for sensing a current imbalance in the line and neutral conductors and developing an output signal proportional to any such current imbalance;
C. a signal source including an auxiliary transformer for inducing a first signal on the neutral conductor effective to produce a current imbalance sensible by said sensing means in the event of a low impedance neutral conductor ground fault;

D. means coupling a second signal to said sensing means effective to counteract the imbalancing effect thereon of said first signal; and

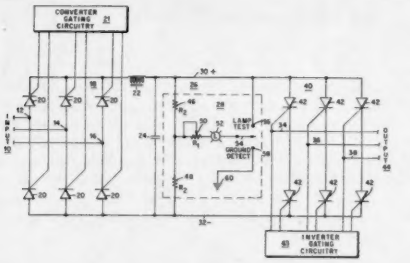
E. signal processing means for processing said output signal such as to initiate circuit interrupting operation of said interrupter contacts when said output signal is substantially zero.

3,857,070

SINGLE-LAMP GROUND DETECTOR FOR CONVERTER-INVERTER POWER SUPPLIES

Jay E. Smith, Pittsburgh, Pa., assignor to The United States of America as represented by the U.S. Atomic Energy Commission, Washington, D.C.

Filed Sept. 7, 1973, Ser. No. 395,328
Int. Cl. H02h *7/14*
U.S. Cl. 317—18 R **4 Claims**



1. A ground detector system for a converter-inverter power supply comprising an AC input converter section, a DC link with a positive and negative line and an AC output inverter section in combination with a fault detecting circuit on the DC link, said fault detecting circuit being connected between the positive and negative lines and comprising a ground detector two-position switch in series with a lamp and a tapped resistor, the ground detector switch having a Lamp Test position connected to the positive line and a Ground Detect position connected to the sole ground, the tapped end of the resistor connected to a common point of two series resistors which are connected between the positive and negative lines, the switch providing that the lamp will light only if there is a fault or non-infinite resistance to ground in one of the AC input lines, AC output lines or DC link when the Ground Detect position is actuated.

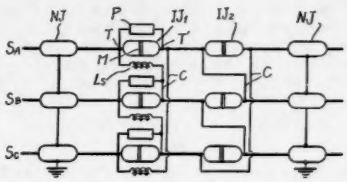
3,857,071

BONDING CIRCUIT FOR REDUCING SHEATH CURRENT OF POWER CABLE LINE

Teruji Nikaido; Kaoru Haga, both of Tokyo; Norio Sugiyama, Mayama-machi, and Yasutaka Fujiwara, Yokohama, all of Japan, assignors to Tokyo Denryoku Kabushiki Kaisha, Tokyo and Showa Densen Denran Kabushiki Kabushi, Kanagawa-ken, both of, Japan

Filed June 1, 1973, Ser. No. 366,165
Claims priority, application Japan, June 16, 1972, 47-60658
Int. Cl. H02h *7/22*
U.S. Cl. 317—44 **3 Claims**

1. A circuit for reducing sheath current in an alternating current three phase line of a single core power cable in which anti-corrosive layers cover the outer surface of the metal sheath, comprising first normal joint box means in each of said phase lines; first wire means connecting the boxes in the respective lines and being grounded; each of said phase lines including first insulated joint box means having back and front contact points, said first insulated joint box means being serially connected via said back contact point to said first normal joint box means, a protective device connected in parallel via said back and front contact points with said first insulated joint box means, second insulated joint box means serially connected to said parallel combination via said front contact point; saturable reactor means coupled between the back contact point of one line with the front contact point of another line, respectively, each of said saturable reactor means reducing the current in said phase lines; each of said phase lines including second insulated joint box means having rear and forward contact points; second wire means connecting the rear contact of said second insulated joint box means of one line with the forward contact point of said second insulated joint box means of another line, respectively; each of said phase lines including second normal joint box means serially



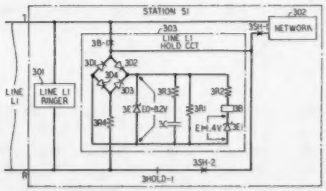
connected via said forward contact point to said second insulated joint box means; third wire means connecting the second normal joint box means in the respective lines and being grounded; each of said protective devices including a first set of parallel connected nonlinear resistance elements for operatively protecting one part of said first insulated joint box means, and being grounded through a discharging gap, and a second set of parallel connected nonlinear resistance elements for operatively protecting another part of said first insulated joint box means, and being grounded through a discharging gap, said protective devices operatively preventing the dielectric break-down in said anticorrosive layers and simultaneously the entering of surge voltages.

3,857,072

RELAY RELEASE TIMING CONTROL CIRCUIT

Dennis Bryan James, Rumson, and James Royce McEowen, Holmdel Township, Monmouth County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill and Bell Telephone Laboratories, Incorporated, Berkeley Heights, both of, N.J.

Filed Dec. 12, 1973, Ser. No. 426,649
Int. Cl. H01h *47/18*
U.S. Cl. 317—141 R **7 Claims**



5. A relay control circuit comprising means for maintaining said relay operated when operate current over a pair of leads is interrupted for a period of time less than a first fixed interval and for insuring that said relay releases when said operate current over said pair of leads is interrupted longer than said first fixed interval but prior to a second fixed interval, said means comprising:

breakdown means having a well-defined voltage level above which current flows through said device and below which current will not flow therethrough, said breakdown means in series with said relay winding, said breakdown means and said relay winding forming a series network;

means concurrently connected to said pair of leads and to said series network for establishing a fixed reference voltage across said series network for maintaining said relay operated, said reference voltage being generated from said operate current;

a timing capacitor concurrently connected in parallel with said series network and with said fixed reference voltage means;

a resistor connected in parallel with said series network;

means responsive to the interruption of said operate current for generating an RC decaying curve of said reference voltage formed by said capacitor and the circuit resistance,

said resistor having a value to adjust said RC decaying curve so that a rapidly decaying voltage portion thereof falls between said first and second intervals, and

wherein said well-defined voltage level of said breakdown device is such that said decaying reference voltage reaches said level between first and second fixed intervals.

3,857,073

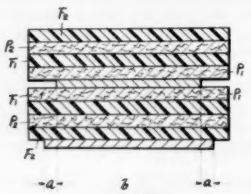
CAPACITOR WITH POLYPROPYLENE DIELECTRIC

Takayuki Yagitani, Hyogo, Japan, assignor to Shizuki Electrical Mfg., Co., Ltd., Nishinomiya, Hyogo, Japan

Filed Apr. 10, 1973, Ser. No. 349,838

Int. Cl. H01g *3/195*

U.S. Cl. 317—258 **2 Claims**



1. In a dielectric liquid impregnated paper/polypropylene film composite wound foil type dielectric capacitor including a first electrode and a second electrode positioned in parallel with and opposite to said first electrode, said first electrode being narrower in width than said second electrode and said capacitor having interleaved layers of said paper and polypropylene film, the improvement comprising both sides of said first electrode being in contact with said paper and said second electrode being in contact with said polypropylene film, said electrodes being separated by at least one layer of interspaced film and paper.

3,857,074

ELECTRICAL CAPACITORS AND METHOD OF MAKING SAME

Hermann Heywang; Manfred Kobale, both of Munich; Karl-Heinz Preissinger, Taufkirchen; Dietrich Ristow, Neubiberg, and Ulrich Wehnelt, Starnberg, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

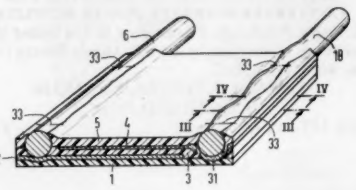
Filed Sept. 19, 1973, Ser. No. 398,864

Claims priority, application Germany, Sept. 27, 1972, 2247260

Int. Cl. H01g *1/14*

U.S. Cl. 317—258 **35 Claims**

1. An electrical capacitor comprising at least two aluminum metal layers, a dielectric layer of synthetic resin material interposed between each adjacent pair of metal layers, said metal and dielectric layers being substantially flat and arranged between a first and second outer cover foil to form a stack, with each of said metal layers, which serves as one electrode of the capacitor, extending to one edge of the stack but not to the opposite edge so as to leave a metal-free edge zone at said opposite edge, and each of said metal layers, which serves as the other electrode of the capacitor, extending to said opposite edge but not to said one edge of the stack, so as to leave a metal-free edge zone at said one edge, and a connecting wire extending longitudinally on said first cover foil along each of said metal-free edge zones, at least specific points on the length of said wires being fused through said first



cover foil and the dielectric layer into electrical contact with the metal layer in the edge zone by an alloy zone between the metal layer and wire so that the wires are mechanically stably secured therein and at least one wire is mechanically stably secured to each of the two cover foils the dielectric layer and the metal layer extendng into said edge zone therebeneath two cover foils, the dielectric layer and the metal layer extending into said edge zone therebeneath mechanically connected in a stable manner.

3,857,075

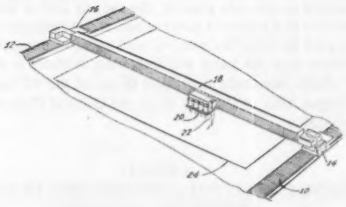
POSITIONING DEVICE

Bruce A. Sawyer, 20120 Allentown Dr., Woodland Hills, Calif. 91364

Continuation of Ser. No. 163,597, July 19, 1971, abandoned. This application Jan. 15, 1973, Ser. No. 323,408

Int. Cl. H02k *41/02*

U.S. Cl. 318—38 **34 Claims**



1. In a system for providing a controlled movement of an output member along first and second coordinate axes, the combination of:

at least a pair of tracks disposed in spaced relationship to each other,

a beam disposed in spaced and perpendicular relationship to the tracks and disposed between the tracks and movable along the tracks in the spaced and perpendicular relationship to the tracks,

first motor means disposed on the beam in spaced but cooperative relationship with one of the tracks for cooperating with that track to produce with that track a motor for providing a controlled movement of the beam along that track in the spaced and perpendicular relationship to the track, and

second motor means disposed on the beam in spaced but cooperative relationship with the other one of the tracks for cooperating with that track to produce with that track a motor for providing a controlled movement of the beam

along that track in the spaced and perpendicular relationship to that track,

the first and second motor means being constructed to receive first polyphase signals and being disposed relative to their associated tracks to provide identical displacements of the beam relative to the tracks at the opposite ends without any rotation of the beam relative to the tracks,

third motor means disposed on the beam in spaced but cooperative relationship with the beam and supporting the output member and cooperating with the beam to produce with the beam a motor for providing a controlled movement of such second means along the beam in the spaced but cooperative relationship with the beam and for providing a movement of the output member with such means,

first signal means operatively coupled to the first and second motor means for introducing the first polyphase signals to the first and second motor means to energize the first and second motor means, and

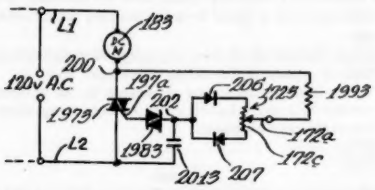
second signal means operatively coupled to the third motor means for introducing second polyphase signals to the third motor means to energize the third motor means.

3,857,076

UPRIGHT VACUUM CLEANER—DRIVE MOTOR CONTROL

Thomas Erwin Hetland, White Bear Lake, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 15, 1973, Ser. No. 323,780
Int. Cl. H02p *5/16*
U.S. Cl. 318—257 **11 Claims**



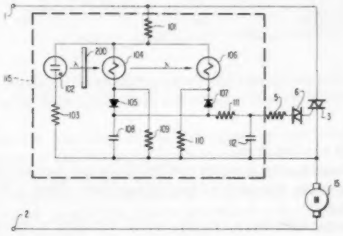
1. In a vacuum cleaner having a selectively positionable operating handle and a wheeled drive including an electric drive motor, conductor means for connecting the vacuum cleaner to an alternating current power supply, the wheels driven by said motor, control means for controlling the propelling of the vacuum cleaner by said wheeled drive comprising: a direct current motor; a bidirectional triode thyristor in series with said motor and said conductor means and having a control gate element; and means responsive to the position of said operating handle relative to an "Off" position thereof for controlling said control gate element and correspondingly providing phase controlled conduction of direct current through said motor during similar polarity half cycles of the alternating current power, including a bidirectional trigger diode having one terminal connected to said control gate element, parallel connected inverse diodes connected to the other terminal of said trigger diode, a capacitor connected between said other terminal of the trigger diode and said conductor means, and adjustable means including adjustable resistance means electrically connected in series with said inverse diodes and said trigger diode, and to said conductor means, said adjustable resistance means including a first resistance portion having a terminal connected to one of said diodes, a second resistance portion having a terminal connected to the other of said diodes, and means interconnecting said resistance portions opposite from said terminals to said conduction means, the adjustable resistance means being adjusted in response to positioning of said handle relative to said Off position and providing preferential current flow through a selected one of said diodes depending on the direction of movement of said handle from said Off position.

3,857,077

SPEED AND DIRECTION CONTROL APPARATUS FOR DC MOTORS

Thomas E. Kasmer, Endicott, N.Y., assignor to Magnetic Laboratories, Inc., Halstead, Pa.

Filed Apr. 27, 1973, Ser. No. 355,109
Int. Cl. H02p *5/16*
U.S. Cl. 318—257 **7 Claims**



1. A speed and direction control circuit for a DC motor comprising:

triggerable bi-directional current conducting means connected in series with said DC motor and an AC power source,

bi-directional breakdown means connected to trigger said triggerable bi-directional current conducting means when the breakdown voltage of said breakdown means is exceeded,

RC timing circuit means connected to the AC power source and to said bi-directional breakdown means for controlling which half cycle and the time during that half cycle of the AC power source when said bi-directional current conducting means is triggered, said RC timing circuit means including

a capacitor connected to discharge through said bi-directional breakdown means when the voltage across said capacitor exceeds said breakdown voltage,

first series-connected photocell and diode circuit means and second series-connected photocell and diode circuit means, said first and second series-connected photocell and diode circuit means being connected in parallel to control the direction and rate of charging of said capacitor, the diodes in said first and second series-connected photocell and diode circuits means being oppositely poled with respect to one another,

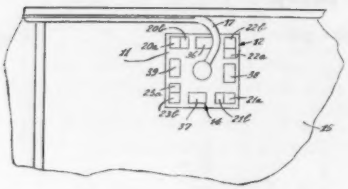
lamp means, and

movable mask means interposed between said lamp means and the photocells in said first and second series-connected photocell and diode circuits means, said mask means having first and second varying transmissibility aperture means disposed with respect to one another along the direction of movement of said movable mask means each of said aperture means controlling the illumination of one of said photocells by said lamp means as a function of the movement of said mask means.

3,857,078
ACTUATING SYSTEM

Bruce A. Sawyer, 20120 Allentown Dr., Woodland Hills, Calif. 91364

Continuation of Ser. No. 157,100, June 28, 1971, abandoned. This application Mar. 26, 1973, Ser. No. 344,563
Int. Cl. G05b 1/01
U.S. Cl. 318—608 24 Claims

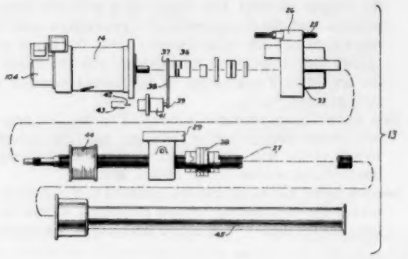


1. In combination,
a platen having a planar configuration and having a plurality of poles disposed at spaced positions along a particular axis,
first pickoff means having poles disposed relative to the poles on the platen to move along the particular axis relative to the platen and to generate a first periodic function in accordance with the movement of the poles on the first pickoff means along the particular axis relative to the poles on the platen,
second pickoff means having poles disposed relative to the poles on the platen to move along the particular axis relative to the platen and disposed relative to the first pickoff means to generate a second periodic function in accordance with the movement of the poles on the second pickoff means along the particular axis relative to the poles on the platen,
means responsive to the generation of the first periodic function in accordance with the movement of the first pickoff means along the first particular axis relative to the platen for generating signals representing the first periodic function,
means responsive to the generation of the second periodic function in accordance with the movement of the second pickoff means along the second particular axis relative to the platen for generating signals representing the second periodic function,
first actuator means having poles disposed relative to the poles on the platen to move along the particular axis relative to the platen and operatively coupled to the first and second pickoff means, the first actuator means being responsive to the signals representing the first periodic function for producing forces for driving the first and second pickoff means in accordance with the characteristics of such signals,
second actuator means having poles disposed relative to the poles on the platen to move along the particular axis relative to the platen and operatively coupled to the first and second pickoff means, the second actuator means being responsive to the signals representing the second periodic function for producing forces for driving the first and second pickoff means in accordance with the characteristics of such signals, and
means responsive to the signals generated by the first and second pickoff means for controlling the operation of the actuator means to prevent the pickoff means and the actuator means from rotating about an axis substantially normal to a surface including the particular axis.

3,857,079
MACHINE TOOL UTILIZING A POTENTIOMETER FOR DETERMINING VARIOUS POSITIONS

John A. Wake, Auburn, and Arthur F. St. Andre, Marlboro, both of Mass., assignors to Cincinnati Milacron-Heald Corp., Worcester, Mass.

Filed Mar. 9, 1973, Ser. No. 339,705
Int. Cl. G05b 1/06
U.S. Cl. 318—663 8 Claims

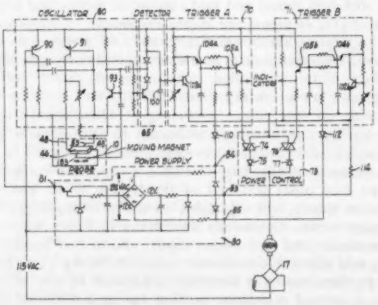


1. A machine tool, comprising
a. a base,
b. a table mounted for sliding movement on the base,
c. an actuator operative between the base and the table, the torque and speed of the actuator being controllable,
d. a primary potentiometer connected to the actuator,
e. a plurality of secondary potentiometers set at selected values,
f. a control for comparing signals from the secondary potentiometers with a signal from the primary potentiometers, and
g. a stop element on the base engaging a stop element on the table at a point in the sliding movement, and
h. means causing the torque generated by the actuator to remain at a pre-selected value during engagement between the stop elements.

3,857,080
PROPORTIONAL CONTROL FOR GUIDANCE SYSTEMS, AND THE LIKE

Shelby Cecil, Brunswick, and Dean D. Riggs, Avon Lake, both of Ohio, assignors to Cecil Equipment Co., Inc., Cleveland, Ohio

Filed Nov. 16, 1972, Ser. No. 307,203
Int. Cl. G05f 1/08
U.S. Cl. 318—681 12 Claims



1. Apparatus for correcting the path of a moving slave device to compensate for variations detected in said path comprising means for converting each detected variation to an

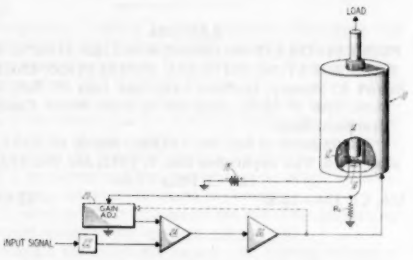
electrical signal modulated in accordance with the variations detected indicating the magnitude and direction of said variation, a motor for moving said slave device to correct its path, a source of time-varying voltage, controllably conductive means between said voltage source and said motor for supplying current to said motor in one or the other direction to cause said motor to move said slave to correct its path, a first trigger circuit responsive to said electrical signals which indicate a variation in one direction for providing trigger signals to said controllably conductive means to cause it to supply current to said motor in a direction to correct the path of said slave device, said trigger signals being provided during each cycle of said time-varying voltage and later in said cycles in proportion to decreasing magnitude of said electrical signals, and a second trigger circuit responsive to said electrical signals which indicate a variation in the opposite direction for providing trigger signals to said controllably conductive means to cause it to supply current to said motor in a direction to correct the path of said slave, said trigger signals being provided during each cycle of said time-varying voltage and later in said cycles in proportion to the decreasing magnitude of said electrical signals, whereby said motor moves slave device in a direction to correct its path and at a rate proportional to the magnitude of said variations.

3,857,081

PROPORTIONAL SOLENOID ACTUATOR

Edward F. Gebelein, Jr., Harwinton, Conn., assignor to Chandler Evans Inc., West Hartford, Conn.

Filed June 25, 1973, Ser. No. 373,001
Int. Cl. G05b *11/00*
U.S. Cl. 318—687 **3 Claims**



1. A solenoid actuator system comprising:

a solenoid, said solenoid having a coil defining an air gap and a plunger movable in said air gap in response to the magnetic field generated as a result of the passage of excitation current through said coil, said plunger being coupled to a load and generating a system output force; non-contacting transducer means positioned in said solenoid air gap, said transducer means including a magnetoresistor for generating an output signal which is a function of solenoid flux density;

comparator means connected to said transducer means and responsive to the flux density signal provided thereby, said comparator means also being responsive to an input signal commensurate with a desired system output force, said comparator means generating an output signal commensurate with the differences between actual solenoid air gap flux density and the flux density which corresponds to the desired plunger output force; and

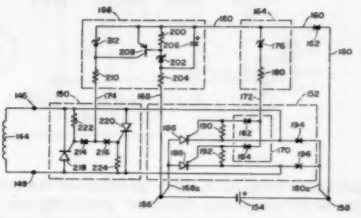
means responsive to the output signal generated by said comparator means for varying the excitation current delivered to said solenoid coil in accordance with the difference between the actual and desired system output force.

3,857,082

ELECTRONIC VOLTAGE REGULATOR FOR BATTERY CHARGING

L. J. Koenraad van Opijnen, Needham, Mass., assignor to Tympanium Corporation, Woburn, Mass.

Filed Sept. 29, 1972, Ser. No. 293,493
Int. Cl. H02j *7/10*
U.S. Cl. 320—25 **7 Claims**



1. A regulator for charging an energy storage element from a source of fluctuating electric potential said regulator comprising:

means for receiving an AC charging current from said source of fluctuating electric potential;

first and second terminals for application of rectified charging current to an electrical energy storage element;

controlled conduction means including a controlled rectifier responsive to AC charging current from said source of fluctuating electrical potential for controlled rectification thereof to provide said rectified charging current across said terminals of said energy storage element;

means for sensing the voltage across said terminals;

means responsive to said sensed voltage being above a predetermined voltage level greater than zero and of the same polarity as said charging signal applied to said first and second terminals representative of the presence of an energy storage element in polarity for charging across said terminals for enabling said controlled conduction means to permit rectified conduction from said source of fluctuating electrical potential to said terminals;

said enabling means including:

means for detecting said first predetermined level to provide a first signal;

means for applying a control signal to said controlled rectifier to provide conduction thereby in response to said first signal;

means responsive to said sensed voltage being above a second predetermined level higher than said first predetermined level and of the same polarity for inhibiting conduction by said controlled conduction means;

said inhibiting means including:

means for detecting said second predetermined level to provide a second signal; and

controlled rectifier means connected for providing a current shunt across said source of fluctuating potential in response to said second signal.

3,857,083

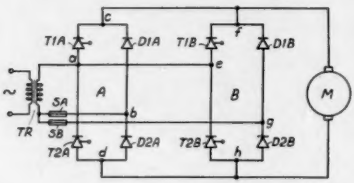
CONVERTOR EQUIPMENT COMPRISING A PLURALITY OF SINGLE-PHASE CONVERTOR BRIDGES

Harry Lundstrom, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Jan. 25, 1974, Ser. No. 436,619
Claims priority, application Sweden, Feb. 2, 1973, 73014326
Int. Cl. H02h *7/14*
U.S. Cl. 321—14 **1 Claim**

1. Convertor equipment comprising a plurality of single-phase convertor bridges connected in parallel on their DC sides, and having DC terminals and having AC terminals

connected to a common AC voltage source for the bridges, each bridge comprising two controllable and two non-controllable rectifier branches, in which the two controllable rectifier branches are connected in series with each other between the DC terminals of the bridge and the two non-controllable rectifier branches are connected in series with



each other between the DC terminals of the bridge, said equipment comprising fuses for protecting the rectifiers against over-currents, in which each bridge is provided with a fuse arranged in the AC lead which is connected to the connecting point between the two non-controllable rectifier branches of the bridge.

3,857,084

BATTERY CHARGING SYSTEMS

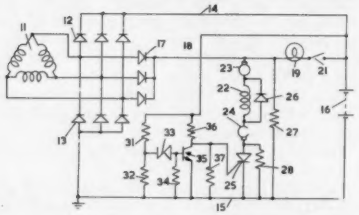
Maurice James Allport, Stourbridge, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed July 25, 1973, Ser. No. 382,381

Claims priority, application Great Britain, Mar. 8, 1972, 36223/72

Int. Cl. H02j *7/16*

U.S. Cl. 322—28 **7 Claims**



1. A battery charging system including a wound-field alternator charging a battery, and a voltage regulator for controlling the output of the alternator, the voltage regulator including a thyristor in series with the field winding of the alternator, means for providing gate current to the thyristor when the battery voltage is below a predetermined value, and the system further including a pair of slip rings providing the required electrical connection to the field winding, one of said slip rings being interrupted so that the anode-cathode path of the thyristor is interrupted from time-to-time to turn the thyristor off.

3,857,085

PULSE GENERATOR OUTPUT REGULATOR

Pieter M. J. Mulier, Minneapolis; Thomas L. Jirak, Crystal, and Lawrence M. Kane, St. Paul, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed May 24, 1972, Ser. No. 256,330

Int. Cl. G01r *19/16;* **A61n** *1/08, 1/36*

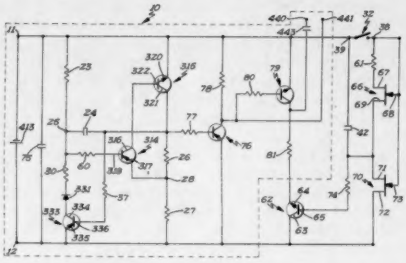
U.S. Cl. 323—22 T **6 Claims**

1. In combination with a pulse generator having power input terminals and an output capacitor, an output voltage regulator for selectively reducing the amplitude of successive output pulses in a generally linear fashion such that each pulse has an amplitude which is lower than the amplitude of the preceding pulse by a generally constant amount which is independent of the amplitude of the preceding pulse comprising:

normally open switch means;

energy storage means;

means connected to said energy storage means and responsive thereto for controlling the charge on said output capacitor;



circuit means connected to said energy storage means and said normally open switch means for charging said energy storage means when said normally open switch means is open; and

constant current means connected to said energy storage means and said normally open means for continuously discharging said energy storage means at a generally constant rate when said normally open switch means is closed.

3,857,086

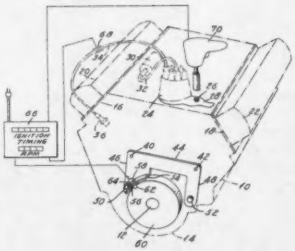
PROCESS FOR ESTABLISHING IGNITION TIMING OF A RECIPROCATING INTERNAL COMBUSTION ENGINE

Robert A. Mooney, Orchard Lake, and John M. Bell, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 124,080, March 15, 1971, abandoned. This application Dec. 7, 1972, Ser. No. 312,996

Int. Cl. F02p *17/00*

U.S. Cl. 324—16 R **12 Claims**



1. A process for reliably and repeatably establishing the ignition timing of a reciprocating internal combustion engine having an engine crankshaft mounted rotatably in an engine block, at least one piston connected to said crankshaft for reciprocating movement in said block, and an ignition mechanism for applying an ignition pulse to the combustion chamber for said piston comprising:

permanently positioning a timing plate having a socket therein on the engine block by locating the timing plate at at least two points of the engine block, said timing plate being fastened to the engine block and remaining fastened to the engine block during normal engine use, said

socket being located adjacent a member that is rotated by the engine crankshaft and has a means representative of the position of a piston, at least one of the two locating points being more remote from the rotated member than is the socket,

removably positioning a pickup device in said socket to produce an electrical signal representative of the position of said piston, whereby the socket defines a permanent reference point available for periodic repositioning of a pickup device to accurately reproduce the established ignition timing, and

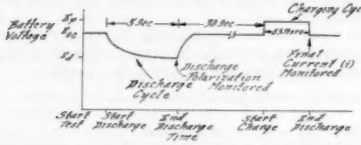
comparing the signal from said pickup device with a signal representative of said ignition pulse to establish ignition timing.

3,857,087

LEAD-ACID BATTERY TEST METHOD

David C. Jones, Austin, Tex., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 12, 1973, Ser. No. 350,434
Int. Cl. G01n *27/42*; **H02j** *7/00*
U.S. Cl. 324—29.5 **7 Claims**



1. A method for testing a lead-acid battery, the steps comprising:

a. subjecting a battery to both transient discharging and transient charging separated by a period of time to allow the battery to recover from either ion depletion or ion adsorption, said transient charging being carried out to obtain a predetermined level of polarization of the battery electrodes and the transient discharging being carried out to obtain a voltage change due to current flow to determine the polarization resulting from discharging,

b. at a predetermined time before the end of said transient charging, measure the transient current,

c. at a predetermined time before the end of the discharging period, measure the transient voltage, and

d. compare the difference between the starting voltage of the battery and the measured transient voltage, and compare the diffference between the transient current and a predetermined reference current, whereby if both the voltage difference is above a predetermined polarization reference value and the transient current is less than said predetermined reference current value, the battery can be deemed defective.

3,857,088

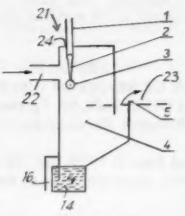
APPARATUS FOR CLEANING A MERCURY-DROPPING ELECTRODE OF A THROUGH-FLOW POLAROGRAPHIC ANALYZER

Miloslav Vesely, and Zdenek Bohac, both of Pardubice, Czechoslovakia, assignors to Vyzkumny ustav organickych syntez, Pardubice, Czechoslovakia

Filed Apr. 7, 1972, Ser. No. 242,044
Claims priority, application Czechoslovakia, Apr. 7, 1971, 2462-71
Int. Cl. G01n *27/42*
U.S. Cl. 324—31 **2 Claims**

1. In a polarographic analyzer including a first input port, an output port having an overflow port at a first vertical level within the analyzer, a measuring space defined between the first input port and the output port, means for introducing into the first input port a test liquid having solid impurities therein, and electrode means disposed in the measuring space for dropping mercury through the test liquid introduced into the first input port, the improvement which comprises:

means including a second input port for introducing into the measuring space a solvent for the solid impurities; and



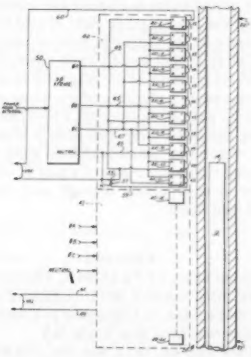
means for positioning the electrode means within the measuring space to expose the electrode means to the solvent introduced through the second input port to dissolve solid impurities that accumulate on the electrode means, the solvent flowing over the electrode without immersing the electrode in the solvent.

3,857,089

MAGNETIC POSITION INDICATOR

Jason A. Adler, Costa Mesa, and David R. Bartlett, Huntington Beach, both of Calif., assignors to Royal Industries, Santa Ana, Calif.

Filed June 8, 1972, Ser. No. 261,009
Int. Cl. G01r *33/00*
U.S. Cl. 324—34 PS **11 Claims**



1. Apparatus for indicating the position of a movable member, which comprises:

signal generating means for producing a variable-phase oscillating electrical signal the phase of which uniquely indicates for a predetermined range of motion the position of the movable member, the signal generating means including means for simultaneously producing a plurality of variable-amplitude, constant-phase oscillating electrical signals, each associated with a different successive one of a plurality of contiguous portions of the predetermined range, having first and second limiting amplitude values, and varying therebetween in accordance with the position of the movable member while the movable member is in the associated portion, each pair of variable-amplitude signals associated with successive portions

having a preselected constant phase between them, and means for forming the variable-phase signal from the variable-amplitude signals; and

phase detecting and indicating means responsive to the variable-phase signal for producing a direct current signal having a magnitude that varies in accordance with changes in phase of the variable-phase signal.

3,857,090

GENERATION OF BEAMS OF CHARGED PARTICLES

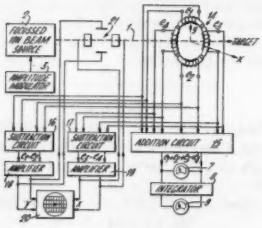
Douglas Richard Chick, Seale, Nr. Farnham, England, assignor to National Research Development Corporation, London, England

Filed June 4, 1973, Ser. No. 366,522

Claims priority, application Great Britain, June 7, 1972, 26558/72

Int. Cl. G01r *33/02*

U.S. Cl. 324—47 **20 Claims**



1. Apparatus for monitoring the current comprised by a beam of charged particles, comprising means for modulating the amplitude of said beam to thereby correspondingly modulate the strength of the magnetic field of said beam, detector means responsive to the magnetic field of said beam to provide at least three output signals each corresponding to the modulation of the strength of the magnetic field of said beam at a respective one of a plurality of positions equally spaced around a desired path of movement of said beam, and means for comparing and developing from said at least three output signals a pair of position signals each indicating the position of said beam along a respective one of a pair of orthogonal axes perpendicular to and passing through said desired path of movement of said beam.

3,857,091

APPARATUS HAVING ULTRASONIC TRANSDUCER FOR DETECTING CABLE DIELECTRIC FAULTS

Sam Kalifon, Old Bridge, N.J., assignor to Continental Copper & Steel Industries, Inc., New York, N.Y.

Filed July 24, 1972, Ser. No. 274,485

Int. Cl. G01r *31/02, 31/08, 31/12*

U.S. Cl. 324—52 **7 Claims**

1. An apparatus for detecting and locating a dielectric fault within a multiconductor cable comprising

a supply reel;

a take-up reel;

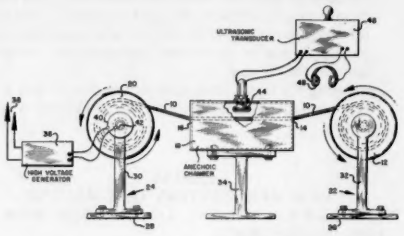
an anechoic chamber having inlet and outlet orifices;

said cable being supplied from said supply reel through said inlet orifice of said anechoic chamber to said take-up reel from the outlet orifice;

a source of high potential connected between the faulty conductor and another conductor at one end of said multiconductor cable and adapted to cause sparking effects adapted to produce high frequency sound waves at uninsulated conductor segments of the cable in the region between the two reels and within the anechoic chamber;

a probe sensitive to high frequency sound waves mounted within said anechoic chamber;

clamp means and guide means to position and guide said cable to maintain a predetermined spacing and separation



of the cable within the said chamber relative to the said probe, and

audio means coupled to said probe means for producing an audible signal when said dielectric fault is detected at the uninsulated cable portion within the chamber.

3,857,092

ELECTRICAL LENGTH MEASURING SYSTEM

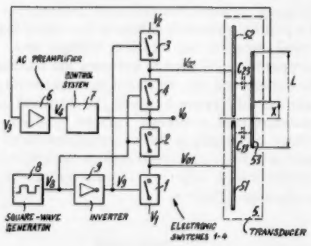
Hans Ulrich Meyer, 5, Chemin du Moulin, Morges, Vaud, Switzerland

Filed Mar. 12, 1973, Ser. No. 340,065

Claims priority, application Switzerland, Mar. 22, 1972, 4241/72

Int. Cl. G01r *27/26*

U.S. Cl. 324—61 R **12 Claims**



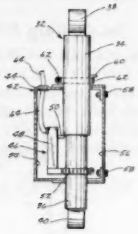
1. Electrical length measuring system comprising a differential capacitor transducer, at least one receiving plate on one side of the capacitor, at least two transmitting plates on the other side of the capacitor, means for moving the sides of capacitor relatively to and in parallel with each other; a control system having an input and an output; a plurality of reference DC voltage sources; switching means for alternately connecting each transmitting plate between the output voltage of the control system and one of the reference DC voltage sources, means for feeding back the alternating voltage picked up by the receiving plate as a result of relative movement between said plates to the input of the control system in such a way that the signal on said at least one receiving plate is driven back to zero whereby to ensure that the output voltage of said control system is in a linear relationship with the relative displacement of the plates of said capacitor.

3,857,093

VEHICLE LOAD MEASURING USING A SHOCK ABSORBER AND VARIABLE RESISTOR

Donald R. Green, 3838 N.E. 44th Dr., Des Moines, Iowa 50317

Filed Aug. 17, 1973, Ser. No. 389,390
Int. Cl. G01r 27/02
U.S. Cl. 324—65 R 7 Claims



1. A device for measuring the load applied to a given axle of a vehicle, said vehicle having a frame and spring means yieldably supporting said frame with respect to said axle, said device comprising in combination,

a shock absorber having an elongated upper member having means for attachment thereof to said frame,

an elongated lower member having means thereon for attachment of said lower member to said axle,

means for movably connecting said upper and lower members whereby movement of said frame with respect to said axle causes said upper and lower members to move,

a variable resistor adjustably attached to said lower member, said resistor having a vertically movable sensor thereon for varying the resistance of said resistor, said sensor being responsive to relative movement of said upper member of said shock absorber with respect to said lower member of said shock absorber, and

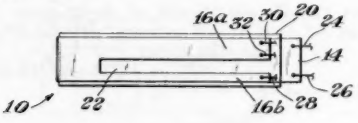
a gauge associated with said resistor for registering the variance in resistance as said sensor moves responsive to movement of said upper and lower shock absorber members.

3,857,094

ELECTRICAL BRIDGE ELEMENT ASSEMBLY FOR CORROSION MEASUREMENT

Victor J. Caldecourt, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 2, 1974, Ser. No. 430,309
Int. Cl. G01r 27/02
U.S. Cl. 324—65 CR 8 Claims



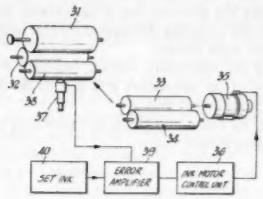
1. An electrical bridge member assembly for use in making measurements of corrosivity of a fluid, comprising a thin strip having at least one metal surface, said strip being folded back on itself to form two arm parts, one arm being split along at least a substantial part of its length, said arms being spaced apart and bonded to electrically insulating heat transfer means which is in layer-like form, said heat transfer means extending from adjacent to the common end of said arms to at least the other end of one of said arms, means for electrically coupling said assembly to external bridge measurement apparatus, and means for shielding all but one surface of one of said arms from said fluid.

3,857,095

METHOD AND APPARATUS FOR MEASURING THE THICKNESS OF A COATING ON A SUBSTRATE

Robert Edward Mitchie, Weybridge, and Peter Michael Hyatt Price, Virginia Water, both of England, assignors to Vickers Limited, London, England

Filed July 25, 1972, Ser. No. 275,109
Claims priority, application Great Britain, July 26, 1971, 35047/71
Int. Cl. G01n 27/00; G01r 33/00
U.S. Cl. 324—71 R 12 Claims



7. A device for determining the thickness of a coating on the surface of a substrate, which device comprises;

i. a support member to be secured adjacent to the substrate.

ii. a pad-like element displaceable with respect to the member towards or away from the substrate, which element has a face provided with gas outlets and includes a transducer having an electrical property which is dependent upon its proximity to an electrically conductive material,

iii. a means of displacing the element with respect to the member towards the substrate, and

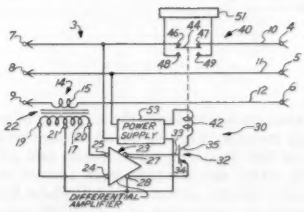
iv. a means of conducting gas to the discharge outlets to maintain the face of the element at a constant distance from the surface of the coating on the substrate.

3,857,096

ELECTRICAL CURRENT LEAKAGE DETECTOR

Lawrence A. Gregory, 1785 Glenview Ave., St. Paul, Minn. 55112

Continuation-in-part of Ser. No. 212,037, Dec. 27, 1971, abandoned. This application Apr. 5, 1973, Ser. No. 348,247
Int. Cl. G01r 1/24, 19/16
U.S. Cl. 324—127 3 Claims



1. A method of detecting the flow of electrical current having a predetermined frequency in a conductor by means of a primary coil, a secondary coil, core means, and a test coil, said method comprising the steps of:

placing the test coil around the core means;

passing an AC current having substantially the predetermined frequency through the test coil;

measuring the flux density and magnetizing force resulting from the passage of the AC current through the test coil to form a hysteresis loop;

determining the core loss resulting from the passage of the AC current through the test coil;

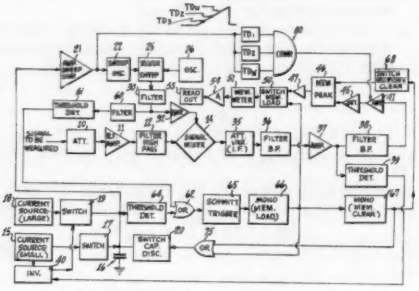
recording the maximum flux density, Bm, of the hysteresis loop;
calculatng the resistivity coefficient, Kr, of the core means by the equation $Kr = CBm^2f^2$/core loss, where C equals a constant;
calculating the permeability, u_o, of the core means by dividing Bm by the corresponding magnetizing force indicated by the hysteresis loop;
calculating the hysteresis coefficient, KQ, of the core means by the equation $KQ=(u_oCfKr)^2/(u_oCf)^2+Kr^2$, where C equals a constant;
altering the core means until KQ/Kr is **0.03** or greater;
connecting the primary coil in series with the conductor;
magnetically coupling the secondary coil to the primary coil with the core means;
detecting the secondary voltage induced across at least a portion of the secondary coil due to the flow of current in the conductor; and
providing an indication when the secondary voltage exceeds a predetermined value.

3,857,097

COMPENSATING TECHNIQUES FOR SENSITIVE WIDE BAND VOLTMETERS

Ronald J. Juels, Freeport, N.Y., assignor to Comstron Corporation, Richmond Hill, N.Y.

Filed July 16, 1973, Ser. No. 379,582
Int. Cl. G01r *15/10, 19/26*
U.S. Cl. 324—132 **10 Claims**



8. In apparatus for measuring the amplitude of an AC signal of the type including a mixing circuit having first and second inputs, said first input adapted to receive said AC signal via amplifying means and a second input adapted to receive a signal from a variable oscillator, said oscillator having a control terminal for application of a sawtooth voltage to said control terminal to vary the frequency to provide at the output of said mixing circuit a difference signal frequency indicative of the difference in frequency between the AC signal and the oscillator signal, said mixing circuit and said amplifying means undesirably providing a non-linear output for AC frequency signals within a predetermined range, in combination therewith the improvemtnt of apparatus for compensating for said non-linearity comprising:

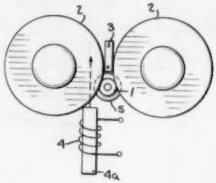
a. level detecting means responsive to said sawtooth voltage for providing a control signal when said sawtooth is at a level manifesting non-linear operation, and
b. means coupled to said mixing means and responsive to said control signal to substantially compensate for said non-linearity.

3,857,098

PROCESS FOR MEASURING THE REVOLUTION SPEED OF A FALSE TWIST TUBE

Peter Dosch, Jona, and Dieter Dorsch, Ebnat-Kappel, both of Switzerland, assignors to Heberlein & Co., AG, Wattwil, Canton of St. Gall, Switzerland

Filed June 20, 1973, Ser. No. 371,593
Claims priority, application Switzerland, June 26, 1972, 9566/72
Int. Cl. G01p *3/48*
U.S. Cl. 324—174 **3 Claims**



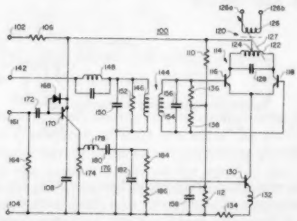
1. Process for electromagnetic measurement of the speed of revolution of a twist tube of a false twisting device wherein said twist tube is fabricated from magnetically susceptible material and has a bore extending transversely of the longitudinal axis thereof, said process comprising the steps of positioning the twist tube in contact with the peripheries of a pair of discs and in a magnetic field to maintain said twist tube pressed against the peripheries of said discs, one of which discs is driven, and positioning an induction measuring probe in the vicinity of said twist tube on the level of said bore and with its longitudinal axis directed towards a point lying beside said twist tube along a radial line through said twist tube and at an angle with respect to the longitudinal axis of said probe, whereby field lines issuing from said twist tube intersect said induction coil obliquely.

3,857,099

MIXER FOR CONTROLLING THE FREQUENCY ACCURACY OF A VARIABLE FREQUENCY OSCILLATOR

Dieter R. Lohrmann, Eatontown, N.J., assignor to The United States of American as represented by the Secretary of the Army, Washington, D.C.

Filed May 8, 1973, Ser. No. 358,423
Int. Cl. H04b *1/26*
U.S. Cl. 325—436 **6 Claims**



1. A mixer comprising:
means for delivering a single frequency from within a predetermined band,
conversion means operable on received sinusoidal energy for delivering periodic pulses that contain a fundamental frequency and a predetermined number of successive harmonics, that have maximum amplitude deviation on the order of 3db within a combined bandwidth slightly

greater than one-half said predetermined band harmonics outside the bandwidth being attenuated,

means for mixing single frequency energy delivered by said first recited means and said periodic pulses and providing an output frequency band of bandwidth numerically less than said fundamental frequency and centered at the center of said predetermined band.

3,857,100

ELECTRONIC SWITCHING ARRANGEMENT HAVING A TOUCH CONTACT

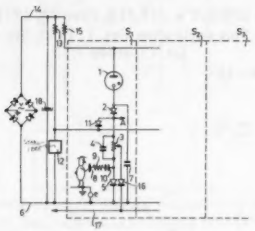
Nicolaas Joris Baars, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 23, 1973, Ser. No. 344,265

Claims priority, application Netherlands, Apr. 14, 1972, 7204999

Int. Cl. H01h *35/00*

U.S. Cl. 328—5 **5 Claims**



1. An electronic switching arrangement having a touch contact, a bistable switching element having an input, a coupling between the touch contact and said input, and an alternating voltage source which is activated when the touch contact is touched for switching over the switching element, characterized in that the said coupling comprises a rectifier circuit for rectifying the alternating voltage and successively a series capacitor, a parallel rectifier element, a series impedance, and a charge capacitor, and said series capacitor has a value which is at least several times lower than that of the charge capacitor, and that the charge time constant of the rectifier circuit is essentially longer than one cycle of the alternating voltage.

3,857,101

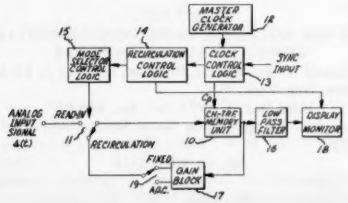
VARIABLE BURST LENGTH WAVEFORM GENERATOR

Charles McD. Puckette, and Walter J. Butler, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 319,352, Dec. 29, 1972, Pat. No. 3,774,167. This application May 31, 1973, Ser. No. 365,513

Int. Cl. Ho3k *3/78*

U.S. Cl. 328—72 **5 Claims**



1. A variable burst length waveform generator programmable as to the number of pulses in each burst and comprising at least one counter having a CLEAR input, CLOCK input, DATA inputs and a CARRY output, said CLEAR input connected to a first source of continuous rectangular waveform voltage signals having a particular repetition rate,

a multi-state switch device having a plurality of outputs connected to the DATA inputs of said counter, said switch device having means for selecting the state thereof so as to selectively provide at least one of the DATA inputs of said counter with a high state input characterized by a high voltage condition, and

first logic NAND gate circuit means for gating on and off rectangular waveform voltage signals supplied from a second source of continuous rectangular waveform voltage signals to form bursts thereof, said first logic NAND gate circuit means having a first input connected to the first source of continuous rectangular waveform voltage signals, a second input connected to the CARRY output of said counter, and a third input connected to the second source of continuous rectangular waveform voltage signals having a fixed repetition rate greater than the repetition rate of the first source signals, output of said first logic NAND gate circuit means connected to the CLOCK input of said counter and also providing the bursts of the second source rectangular waveform voltage signals wherein the number of pulses in each burst is determined by the high state DATA input to said counter to thereby provide a burst waveform generator having a variable burst length output which is programmable as to the number of pulses in each burst for fixed repetition rates of the voltage signals supplied from the first and second signal sources by means of selection of the state of said switch device alone.

3,857,102

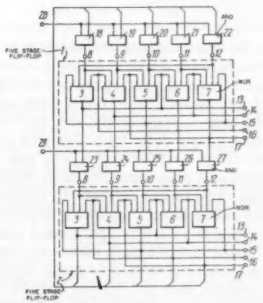
PULSE COUNTER

Dzintar Karlovich Zibin, ulitsa Kveles, 15, korpus 6, kv. 10, Riga, U.S.S.R.

Filed Feb. 13, 1973, Ser. No. 332,138

Int. Cl. H03k *23/02*, *23/08*

U.S. Cl. 328—41 **1 Claim**



1. A pulse counting circuit comprising; a first *n*-stage flip-flop, each stage having a plurality of inputs, and an output; a second *n*-stage flip-flop, each stage having a plurality of inputs, and an output; a first group of logic elements including *n* logic AND-gates, each gate having two inputs, and an output; a second group of logic elements including "n" logic AND- gates, each gate having two inputs, and an output; said output from each respective stage of said first *n*-stage flip-flop being connected to a respective input of a different AND-gate of said second group of elements, the output from each said AND-gate of said second group being connected to a respective input of a different stage of said second *n*-stage flip-flop; said output from each respective stage of said second *n*-stage

flip-flop being connected to a respective input of a different AND-gate of said first group of elements, the output from each said AND-gate of said first group being connected to a respective input of a different stage of said first *n*-stage flip-flop; the other input of each -AND-gate of said first group being interconnected and forming a first count input; the other input of each AND-gate of said second group being interconnected and forming a second count input; wherein the output of each stage of said first *n*-stage flip-flop is connected to another input of each of *s* other stages of said first *n*-stage flip-flop; and wherein the output of each stage of said second *n*-stage flip-flop is connected to another input of each of *s* other stages of said second *n*-stage flip-flop; *n* constituting a number at least equal to **5**, and wherein *s* constitutes a number where $2 \leq s \leq n-3$.

3,857,103

SYSTEM AND DEVICE TO COMPARE THE PHASE AND FREQUENCY BETWEEN ELECTRICAL SIGNALS

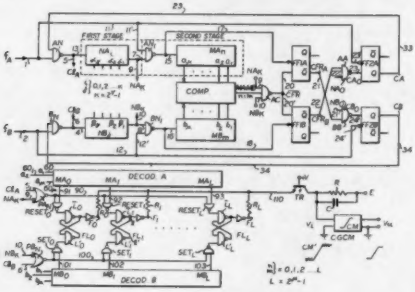
Gianni Grazia, c/o Telettra, Via Trento, 30, 20059 Vimercate-Milan, Italy

Filed Dec. 7, 1972, Ser. No. 312,964

Claims priority, application Italy, Dec. 10, 1971, 32204/71

Int. Cl. H03d *13/00*

U.S. Cl. 328—133 **3 Claims**



1. A system for discriminating frequency and measuring a phase difference between a pair of periodic signals each having an associated frequency and phase comprising means for obtaining first and second pulse trains from said first and second periodic signals, respectively; first and second gating means connected to said pulse train obtaining means for respectively controlling the provision of said first and second pulse trains from said pulse train obtaining means; first and second counting chain means respectively connected to said first and second gating means outputs for respectively providing a time framing to said first and second pulse trains to provide time framed output signals therefrom; common comparator means connected to said first and second counting chain means outputs; first and second decoder means connected in parallel to said first and second counting means outputs respectively; cycle suppressor means connected to said comparator means output and to said first and second pulse obtaining means outputs and said first and second gating means outputs for receiving signals corresponding to the last count of said first and second counting chains for sampling the comparison between said first and second signals in the last count of each sampling interval, said cycle suppressor means output beng connected in a feedback path to said first and second gating means inputs for providing inhibit signals thereto to inhibit the provision of said first and second pulse trains to said first and second counting chain means respectively; bistable means having an input connected in common to said first and second decoder means outputs and to said first and second gating means outputs; and converter means connected to said bistable means output for providing an output signal whose potential value varies in response to the phase difference between the first and second periodic signals in accordance with a non-decreasing monotonic function having a predetermined range of values between a maximum and a minimum value of phase difference wherein the output value of the potential value of said output signal is linearly related to phase difference until said maximum value is obtained, said output potential value remaining constant for phase differences greater than the phase difference corresponding to said maximum value and said output potential value is linearly related until said minimum value is obtained, said output potential value remaining constant at said minimum value for phase differences less than the phase difference corresponding to said minimum output potential value.

3,857,104

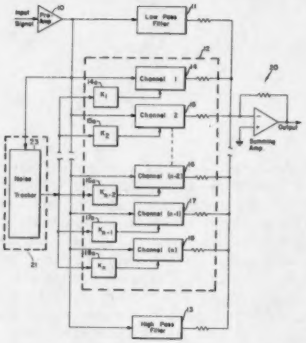
NOISE FILTER

Jack Sacks, 26524 Basswood, Palos Verdes Estates, Calif. 90247

Division of Ser. No. 158,519, June 30, 1971, Pat. No. 3,803,357. This application Oct. 1, 1973, Ser. No. 402,099

Int. Cl. H04b *1/10*

U.S. Cl. 328—167 **13 Claims**



1. A noise filter comprising,

an input narrow band filter adapted to be connected to a wide band source of audio frequencies,

an amplitude controllable threshold nonlinear device that is fed by said input narrow band filter, and

an output narrow band filter connected to the output of the nonlinear device having a band pass characteristic similar to the input filter, and

a noise tracker connected to said non-linear device for generating a signal proportioned to noise whereby the amplitude threshhold of said non-linear device is controlled.

3,857,105

CASCADE AMPLIFIER USING COMPLEMENTARY CONDUCTIVITY TRANSISTORS

Leslie Ronald Avery, Byfleet, England, assignor to RCA Corporation, New York, N.Y.

Filed Dec. 3, 1973, Ser. No. 420,857

Claims priority, application Great Britain, Apr. 13, 1973, 18030/73

Int. Cl. H03f *3/18*

U.S. Cl. 330—17 **8 Claims**

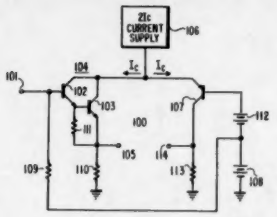
4. An amplifier comprising:

means for supplying reference and biasing potentials;

current amplifier means having an input terminal and output terminals between which a predetermined current

gain is exhibited and having a common terminal connected to receive a first of said biasing potentials;

first and second transistors of complementary conductivity types each having a base and an emitter and a collector electrode, said first transistor base electrode being arranged to receive applied input signal and to have a second of said biasing potentials direct coupled thereto, said second transistor base electrode connected to receive a third of said biasing potentials, and said first transistor collector electrode and said second transistor emitter electrode connected to said output terminal of said current amplifier means;



first and second resistors having substantially equal resistances, said first resistor connecting said first transistor emitter electrode to said reference potential and being of value to cause a quiescent collector current I_C to flow in response to said second biasing potential, and said second resistor connecting said second transistor collector electrode to said reference potential; and

means for applying a bias current to the input terminal of said current amplifier means of a value to cause a current $2I_C$ to flow via its output terminal.

3,857,106

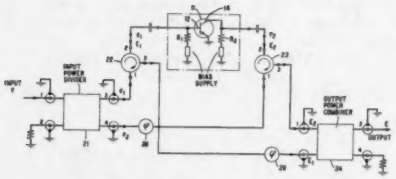
AMPLIFIER WITH N-PORT SIGNAL EXCITATION

Harold Seidel, Warren, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Sept. 4, 1970, Ser. No. 69,578

Int. Cl. H03f *3/60*

U.S. Cl. 330—53 **10 Claims**



1. An amplifier comprising:

an n-port active network, where *n* is an integer greater than one;

means for dividing an input signal into *n* components and for coupling each of said components to a different one of said *n* ports;

and means for coupling all of the energy scattered from said *n* ports to a common output terminal.

3,857,107

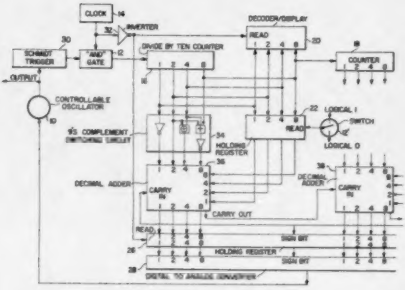
DIGITAL COUNTER FREQUENCY CONTROL SYSTEM

Stuart I. Lieberman, and Theodore H. Hopp, 1407 Chilton Dr., both of Silver Spring, Md. 20904

Filed June 19, 1973, Ser. No. 371,430

Int. Cl. H03b *3/04*

U.S. Cl. 331—1 A **4 Claims**



1. An automatic frequency control system for a controllable oscillator, said system comprising:

sampling means for periodically sampling the output frequency of the oscillator and for generating a sampled signal representative of the oscillator output frequency during the current sampling period;

counter means for counting the current sampled signal during each successive sampling period;

storage circuit means for storing the immediately preceding count of said counter means representative of the oscillator output frequency during the immediately preceding sampling period while said counter means is counting the current sampled signal during the next successively sampling period;

comparator means for successively comparing each current count within said counter means with each preceding count stored in said storage circuit means and for generating an error signal representative of any compared difference during each sampling period; and

means for applying said error signal to the oscillator as a control signal therefor, whereby the oscillator frequency is set and stabilized.

3,857,108

FREQUENCY DRIFT COMPENSATION FOR A VOLTAGE CONTROLLED OSCILLATOR

Willy Kanow, Berlin, Germany, assignor to Loewe-Opta GmbH, Berlin, Germany

Filed July 6, 1973, Ser. No. 377,047

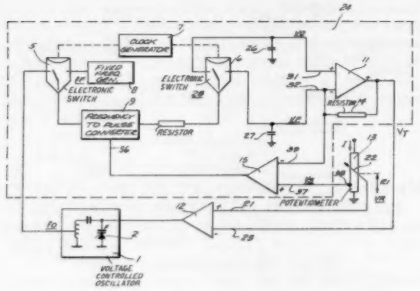
Claims priority, application Germany, July 8, 1972, 2233724

Int. Cl. H03b *3/04*

U.S. Cl. 331—14 **4 Claims**

1. For use in a communications receiver including a voltage controlled oscillator wherein converting means translates the instantaneous oscillator output into a succession of DC pulses which have a repetition rate proportional, by an adjustable conversion factor, to the oscillator frequency and which are integrated in a first storage capacitor and wherein a tuning control voltage derived from the integrated output of the first capacitor is compared with a reference voltage obtained from a first variable tap of a potentiometer, the difference between the last-mentioned two voltages being operable to adjust the output frequency of the oscillator, the improvement comprising: a fixed frequency generator; a second storage capacitor; first switching means operable at a clock rate for coupling the output of the oscillator to the input of the converting means during a first portion of each clock period and for coupling the output of the fixed frequency generator to the input of the

converting means during a second portion of each clock period; second switching means operable at the clock rate in synchronism with the first switching means for coupling the output of the converting means to the first capacitor during the first portion of each clock period and for coupling the output of the converting means to the second capacitor during the second portion of each clock period; means for operating



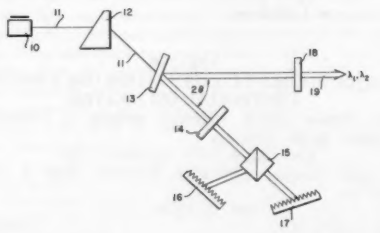
the first and second switching means at the clock rate; a first differential amplifier having first and second inputs; means for coupling the output of the first capacitor to the first input of the first amplifier; and means for coupling the output of the second capacitor to the second input of the first amplifier, the output of the first amplifier constituting the tuning control voltage.

3,857,109

LONGITUDINALLY-PUMPED TWO-WAVELENGTH LASERS

Herschel S. Pilloff, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 21, 1973, Ser. No. 418,016
Int. Cl. H01s *3/20*
U.S. Cl. 331—94.5 **3 Claims**



1. A laser system with simultaneous two wavelength operation; which comprises,

a laser for producing an exciting laser beam,

an optical beam deviating prism in optical alignment with said laser for deviating the optical path of said exciting laser beam,

a first mirror in optical alignment with said deviating prism for transmitting the incident deviated exciting laser beam toward an active optical material cell,

said first mirror having high transmission at the wavelength of the exciting laser beam and very high reflectivity at the two wavelength operation of said system,

an active optical material cell so positioned to receive the exciting laser beam transmitted by said first mirror for excitation thereof,

a polarizer adjacent said cell in optical alignment therewith, first and second wavelength selective elements optically positioned to receive mutually polarized light and reflecting a desired beam therefrom, and

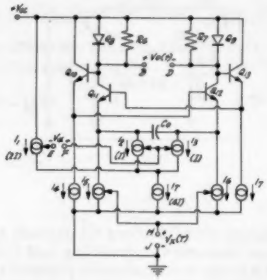
an output coupler partially reflective mirror in optical alignment with radiation reflected by said first mirror.

3,857,110

VOLTAGE CONTROLLED OSCILLATOR WITH TEMPERATURE COMPENSATING BIAS SOURCE

Alan B. Grebene, Saratoga, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Division of Ser. No. 283,555, Aug. 24, 1972, abandoned, which is a continuation of Ser. No. 105,538, Jan. 11, 1971, abandoned. This application July 20, 1973, Ser. No. 381,041
Int. Cl. H03k *3/282*
U.S. Cl. 331—108 D **12 Claims**



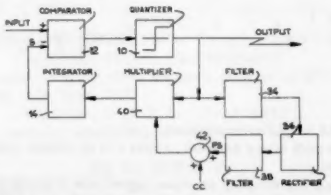
1. A voltage controlled oscillator responsive to the magnitude of an input control signal for producing a frequency related to such magnitude comprising: a semiconductive substrate; a multivibrator having timing capacitor means; current source means integrated into said substrate, coupled to said capacitor means, and responsive to said control signal for determining the frequency of oscillation of said multivibrator. and a temperature dependent network integrated into said substrate for biasing said current source means, said network including balanced bridge means having a center leg carrying negligible current for providing a biasing voltage for said current source means.

3,857,111

SYLLABIC ADAPTATIVE DELTA MODULATION SYSTEM

Pierre A. Deschenes, Sherbrooke; Hubert Stephenne, Rock Forest, and Michel Villeret, Sherbrooke, all of Quebec, Canada, assignors to Universite De Sherbrooke, Sherbrooke, Quebec, Canada

Filed Mar. 20, 1973, Ser. No. 342,945
Int. Cl. H03k *13/22*
U.S. Cl. 332—11 D **9 Claims**



1. A syllabic adaptive delta modulator comprising:

a. a comparator having a first input, a second input and a single output, an analog signal being fed to said first input;

b. quantizing means for sampling the output signal of said comparator to generate delta modulated pulses having low frequency components;

c. a syllabic filter connected to the output of said quantizing means for filtering the low frequency components of said delta modulated pulses;

d. a multiplier connected to the output of said quantizing means and responsive to said syllabic filter for modulating the amplitude of said delta modulated pulses with the low frequency components detected by the syllabic filter; and

e. an integrator connected to said multiplier for integrating the amplitude modulated delta pulses, the output of said integrator being applied to the second input of said comparator for comparing the output signal of the integrator with the input analog signal and for generating a signal depending upon the difference between the two signals.

3,857,112

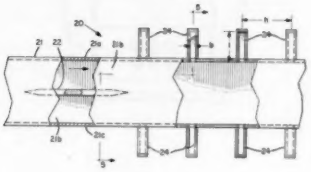
BROADBAND QUARTER-WAVE PLATE ASSEMBLY

James J. Epis, Sunnyvale, Calif., assignor to GTE Sylvania Incorporated, Mountain View, Calif.

Filed Nov. 2, 1973, Ser. No. 412,297

Int. Cl. H01p *1/18*

U.S. Cl. 333—21 A **18 Claims**



1. A broadband quarter-wave plate assembly comprising

a waveguide having a wall and adapted to propagate electromagnetic waves therethrough, a substantially planar phase changing element extending transversely of the interior of said waveguide, and

at least one waveguide stub having a rectangular cross-section with one dimension longer than the other and communicating with the interior of said waveguide through said wall with the axis of said stub at said wall normal to the plane of said element,

the longer of the cross-sectional dimensions of said stub being smaller than the width of the interior of said waveguide.

3,857,113

MICROWAVE ACOUSTIC DELAY LINE

Ho-Chung Huang, Hightstown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 30, 1974, Ser. No. 437,968

Int. Cl. H03h *7/30;* **H01p** *1/10, 1/32*

U.S. Cl. 333—30 R **10 Claims**

1. A delay line having an input terminal and an output terminal for providing a predetermined delay for input signals, comprising:

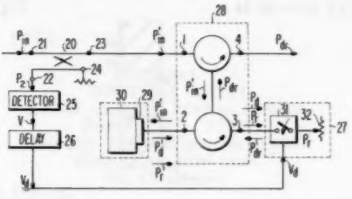
sampling means coupled to said input terminal for sampling a predetermined portion of said input signal;

detector means coupled to said sampling means for detecting and converting said sampled input signal to a D.C. voltage signal;

first delay means coupled to said detector means for delaying said D.C. voltage signal, for said predetermined delay;

second delay means providing a delayed portion and an undelayed portion of said input signal;

signal directing means having a first terminal coupled to said sampling means and a second terminal coupled to said second delay means, said directing means providing a conductive path for said input signal from said sampling means to said second delay means; and



switching means coupled to said first delay means, a third terminal of said directing means and said output terminal, said switching means operating in response to said delayed D.C. voltage signal to selectively provide a signal absorbing termination for said undelayed portion of said input signal and a conductive path to said output terminal for said delayed portion of said input signal.

3,857,114

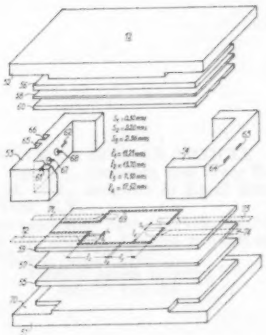
SUPERCONDUCTIVE MICROWAVE FILTER

Roger P. Minet; Jean H. Debeau, both of 60 Residence Corlay, 22300 Lannion, and Ernest L. Thepault, 2 Rue du Docteur Roux, 22700 Perros-Guirec, all of France

Filed Feb. 20, 1974, Ser. No. 444,103

Int. Cl. H01p *1/20, 3/08, 7/00*

U.S. Cl. 333—73 S **4 Claims**



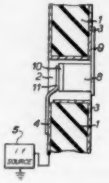
1. A superconductive multiresonator microwave filter of strip transmission line structure housed in a cryostat comprising ground plates made of a superconductive metal, dielectric sheets bonded to said ground plates, a central metallic strip conductor bonded to said dielectric sheets, said ground plates, dielectric sheets and central conductor forming sections of strip-line, the resonance frequency of the resonators of the filter depending upon the lengths of said strip-line sections, pads of dielectric material having a tapered end portion, notches in said dielectric sheets forming sliding paths for said pads intersecting said strip-line sections and control means for remotely positioning said pads from the outside of said cryostat.

3,857,115

SEMICONDUCTOR DEVICE MOUNTING ARRANGEMENTS

Philip Henry Wisbey, Braintree, England, assignor to The Marconi Company Limited, Chelmsford, Essex, England

Filed May 30, 1972, Ser. No. 257,679
Int. Cl. H01p 3/00
U.S. Cl. 333—84 M 13 Claims



13. A combined wageguide component-stripline circuit assembly comprising, in combination;

an insulating block having an aperture therethrough defining a waveguide portion guiding microwave energy, at least a portion of the internal surface of said block which defines said aperture having a metallic film thereon forming part of said strip-line circuit;

semiconductor means disposed within said aperture for modifying microwave energy in said aperture and having a pair of terminals;

a metallic strip electrically connecting one of said pair of terminals to said metallic film;

a stripline on said block extending transverse to the axis of said aperture and leading thereto;

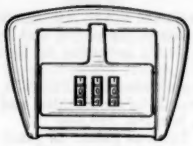
a second metallic strip electrically connecting the other terminal of said semiconductor means to said stripline, the metallic strip first mentioned and said second metallic strip serving also to locate and support said semiconductor means in said aperture; and

r.f. by-pass capacitor means formed between said metallic film within the aperture and that end of said stripline adjacent said aperture for reducing loss of microwave power from said waveguide portion into said stripline.

DESIGNS

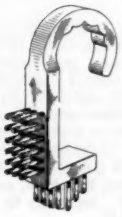
DECEMBER 24, 1974

233,959
COMBINED BUCKLE AND COMBINATION LOCK
Lazlo Bako, Woodcliff Lake, N.J., assignor to Presto Lock Co., Division of Walter Kidde & Company, Inc., Clifton, N.J.
Filed Jan. 26, 1972, Ser. No. 221,133
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—42

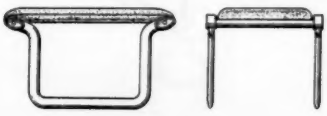


233,960
DRESS
Karen M. Bentley, 40355 Dutton, Cherry Valley, Calif. 92223
Filed Feb. 26, 1973, Ser. No. 335,790
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—72

233,961
DENTURE BRUSH
Lois H. Crawford, 2949 N. Jackson, Fresno, Calif. 93703
Filed July 11, 1973, Ser. No. 378,333
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—24



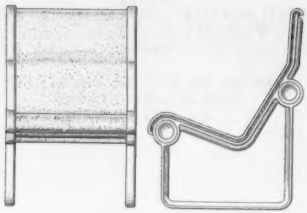
233,962
BENCH OR SIMILAR ARTICLE
Andrew Ivar Morrison, Brooklyn, and Bruce R. Hannah, Staten Island, N.Y., assignors to Knoll International, Inc., New York, N.Y.
Original design application May 18, 1970, Ser. No. 23,026, now Patent No. 225,923. Divided and this application Oct. 24, 1972, Ser. No. 299,647
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—35



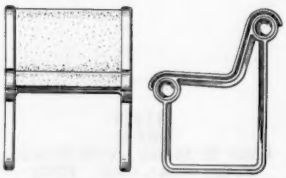
233,963
T-SLING CHAIR
Gerry D. Welton, 910 E. Tripp, Peoria, Ill. 61603
Filed May 1, 1973, Ser. No. 356,104
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—55

233,964
ARMCHAIR OR SIMILAR ARTICLE
Andrew Ivar Morrison, Brooklyn, and Bruce R. Hannah, Staten Island, N.Y., assignors to Knoll International, Inc., New York, N.Y.
Original design application May 18, 1970, Ser. No. 23,025, now Patent No. 225,923. Divided and this application Oct. 24, 1972, Ser. No. 299,644
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—66

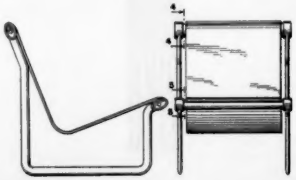
233,965
CHAIR OR SIMILAR ARTICLE
Andrew Ivar Morrison, Brooklyn, and Bruce R. Hannah, Staten Island, N.Y., assignors to Knoll International, Inc., New York, N.Y.
Original design application May 18, 1970, Ser. No. 23,025, now Patent No. 225,946. Divided and this application Oct. 24, 1972, Ser. No. 299,645
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—66



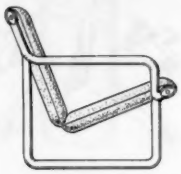
233,966
CHAIR OR SIMILAR ARTICLE
Andrew Ivar Morrison, Brooklyn, and Bruce R. Hannah, Staten Island, N.Y., assignors to Knoll International, Inc., New York, N.Y.
Original design application May 18, 1970, Ser. No. 23,025, now Patent No. 225,946. Divided and this application Oct. 24, 1972, Ser. No. 299,646
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—66



233,967
CHAIR OR SIMILAR ARTICLE
Andrew Ivar Morrison, Brooklyn, and Bruce R. Hannah, Staten Island, N.Y., assignors to Knoll International, Inc., New York, N.Y.
Original design application May 18, 1970, Ser. No. 23,026, now Patent No. 225,923. Divided and this application Oct. 24, 1972, Ser. No. 299,648
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—66

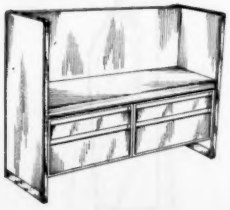


233,968
ARMCHAIR OR SIMILAR ARTICLE
Andrew Ivar Morrison, Brooklyn, and Bruce R. Hannah, Staten Island, N.Y., assignors to Knoll International, Inc., New York, N.Y.
Original design application May 18, 1970, Ser. No. 23,026, now Patent No. 225,923. Divided and this application Oct. 24, 1972, Ser. No. 299,649
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—66



233,969
CHAIR
Kenichi Katoda, Otsuki, Japan, assignor to France Bed Co., Ltd., Tokyo, Japan
Filed Feb. 28, 1973, Ser. No. 336,484
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—76

233,970
STORAGE UNIT
Ronald R. Hodges, Grandville, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.
Filed May 22, 1973, Ser. No. 362,847
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—166

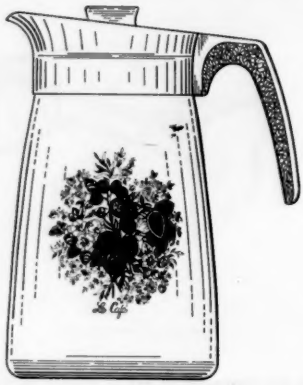


233,971
TABLE
Ronald R. Hodges, Grandville, and Jack Hockenberry, Grand Rapids, Mich., assignors to Steelcase Inc., Grand Rapids, Mich.
Filed May 22, 1973, Ser. No. 362,851
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177

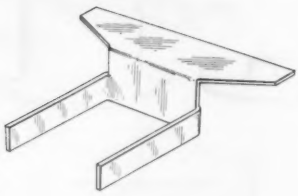
233,972
CHILD'S DRINKING MUG AND LID THEREFOR
Sven-Eric Juhlin, Gustavsberg, Sweden, assignor to AB Gustavsbergs Fabriker, Gustavsberg, Sweden
Filed June 19, 1972, Ser. No. 264,251
Claims priority, application Sweden Dec. 21, 1971
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—10

233,973
DISPENSER FOR GRANULAR MATERIALS
Paul V. Jensen, 3731 NE. 68th Terrace, Kansas City, Mo. 64119
Filed Apr. 19, 1973, Ser. No. 352,641
Term of patent 3½ years
Int. Cl. D7—*01*
U.S. Cl. D7—17

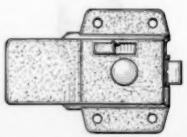
233,974
COFFEEMAKER
Alice Kiernan, Lewiston, Maine, and Patricia A. Luzier and Gregory Mirow, Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.
Filed Apr. 20, 1973, Ser. No. 353,120
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—65



233,975
LINOLEUM LAYER'S CORNER SCRIBER
Kenneth P. Lee, 995 Lonus St., San Jose, Calif. 95126
Filed Apr. 9, 1973, Ser. No. 348,989
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—16



233,976
BATHROOM DOOR LOCK
Keith E. Ridgway, West Covina, Roger Dahl, La Puente, and Howard B. Gorton, San Gabriel, Calif., assignors to Ajax Hardware Corporation
Filed Aug. 3, 1973, Ser. No. 385,585
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—133

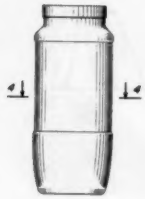


233,977
PORTABLE CORD AND ROPE STORAGE RACK
Gilbert A. Dyal, 4715 W. Anton Road, Tucson, Ariz. 85706
Filed Jan. 28, 1974, Ser. No. 437,046
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—220

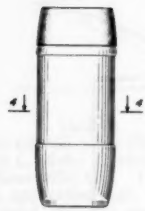
233,978
TAG HOLDER
Donald M. Palmer, 2627 SE. 68th Ave., Portland, Oreg. 97206
Original design application May 17, 1971, Ser. No. 144,395, now Patent No. 227,194. Divided and this application Apr. 16, 1973, Ser. No. 351,499
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—243

233,979
BOTTLE
Emiliano P. Latorre, Fuenmayor, Logrono, Spain, assignor to A.G.E. Bodegas Unidas S.A., Rioja, Logrono, Spain
Filed Aug. 17, 1972, Ser. No. 281,506
Claims priority, application Spain Mar. 23, 1972
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—54

233,980
BOTTLE
Donald George Watt, Toronto, Ontario, Canada, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland
Filed Mar. 2, 1973, Ser. No. 337,679
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—115

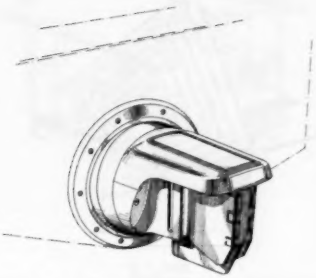


233,981
COMBINED BOTTLE AND CAP THEREFOR
Donald George Watt, Toronto, Ontario, Canada, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland
Filed Mar. 2, 1973, Ser. No. 337,673
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—117

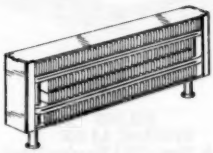


233,982
BOTTLE
William E. De Graw, Modesto, Calif., assignor to E. & J. Gallo Winery, Modesto, Calif.
Filed May 9, 1973, Ser. No. 358,666
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—148

233,983
HYDROJET BOAT DRIVE
Kenneth R. Baker, Encino, and Ronald E. Plescia, San Jose, Calif., assignors to Marine Propulsion Systems, Inc.
Filed Mar. 1, 1973, Ser. No. 337,192
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D12—70

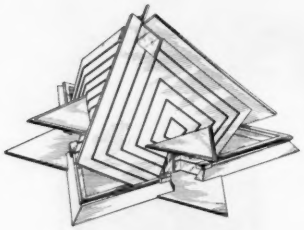


233,984
OIL COOLER FOR MOTORCYCLES
William C. Hauser, Hacienda Heights, Calif., assignor to Lockhart Industries, Inc., Paramount, Calif.
Filed June 1, 1973, Ser. No. 366,138
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—114

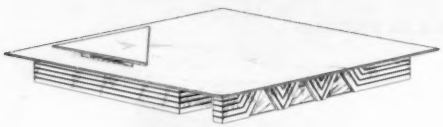


233,985
MOTEL ROOM BUILDING
Jimmie L. Jones, Salt Lake City, Utah, assignor to Ute Indian Tribe of the Uintah and Ouray Reservation, Uintah County, Utah
Filed May 2, 1972, Ser. No. 249,746
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 B

233,986
PUBLIC BUILDING
Jimmie L. Jones, Salt Lake City, Utah, assignor to Ute Indian Tribe of the Uintah and Ouray Reservation, Uintah County, Utah
Filed May 2, 1972, Ser. No. 249,750
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 B

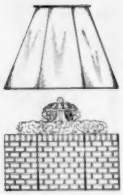


233,987
RESTAURANT BUILDING
Jimmie L. Jones, Salt Lake City, Utah, assignor to Ute Indian Tribe of the Uintah and Ouray Reservation, Uintah County, Utah
Filed May 2, 1972, Ser. No. 249,751
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 B



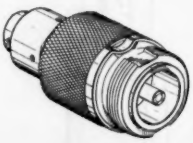
233,988
FISHING LURE
Don A. Best, 1512 Barclay Road, Oklahoma City, Okla. 73120
Filed Apr. 23, 1973, Ser. No. 353,826
Term of patent 7 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

233,989
FOUNTAIN
Virgil C. Camp, 3749 Cornell, Des Moines, Iowa 50313
Filed Oct. 11, 1972, Ser. No. 296,662
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—13

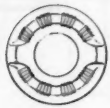


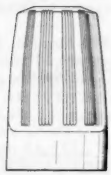
233,990
CONTROL CENTER SUPPORT ARM FOR DENTAL CHAIRS
Dwight A. Booth, Portland, Oreg., assignor to MDT Instrument Company, Gardena, Calif.
Filed Nov. 3, 1973, Ser. No. 412,303
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—1 B

233,991
ELECTRICAL CONNECTOR
Henry Oliver John Smith, 23 Howland St., London, W1p 6 Hq, England, and Edward Arnold Summerfield, 7 Broadmead, Close Hatch End, Pinner, Middlesex, England
Filed Sept. 25, 1972, Ser. No. 291,549
Claims priority, application Great Britain Mar. 30, 1972
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 A



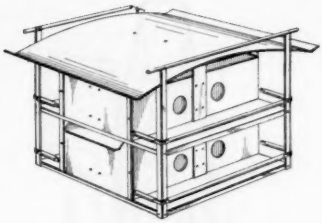
233,992
ELECTRICAL WIRE CONNECTOR
Donald P. Marr, Islington, Ontario, and Thomas A. Corbett, Toronto, Ontario, Canada, assignors to Marr Electric Limited, Mississauga, Ontario, Canada
Filed Nov. 2, 1973, Ser. No. 412,176
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D26—1 C





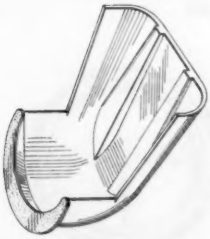
233,993
COMBINED CROSS AND PEACE SYMBOL
Marvin L. Hicks, 22 Melville Ave., Greenville, S.C. 29605
Original design application Apr. 11, 1973, Ser. No. 349,964. Divided and this application Mar. 27, 1974, Ser. No. 455,313
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23 A

233,994
MULTICOMPARTMENT BIRDHOUSE
James K. Bishop, Sr., Box 117A, Rte. 2, Buffalo, Mo. 65622
Filed Apr. 19, 1973, Ser. No. 352,642
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—3

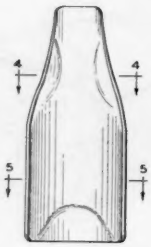


233,995
MEDICAL TUBING RESTRAINT HOLDER OR SIMILAR ARTICLE
Bruce B. Miller, 3417 Canfield Road, Eaton Rapids, Mich. 48827
Filed Mar. 22, 1973, Ser. No. 343,739
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D32—1 R

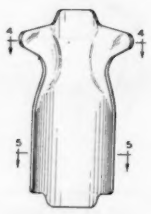
233,996
COMBINATION INTEGRAL POCKET LINER AND GULLEY BOOT FOR A BILLIARD TABLE OR THE LIKE
Gordon W. Murrey, 14150 S. Figueroa, Los Angeles, Calif. 90061
Filed Apr. 5, 1973, Ser. No. 348,194
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—3



233,997
TURRET BOWLING PIN HOLDER
Charles E. Schalitz, 10351 Lakewood Drive, Luna Pier, Mich. 48157
Filed Apr. 9, 1973, Ser. No. 348,930
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 DD

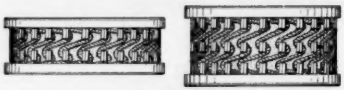


233,998
TURRET BOWLING PIN HOLDER
Charles E. Schalitz, 10351 Lakewood Drive, Luna Pier, Mich. 48157
Filed Apr. 9, 1973, Ser. No. 348,931
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 DD

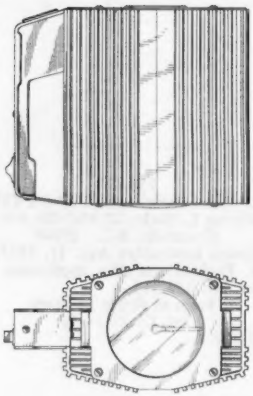


233,999
AERIAL TOY
John W. Potter, 3375 Rancho Del Monico, Covina, Calif. 91722
Filed June 26, 1972, Ser. No. 266,485
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 HS

234,000
FINGER RING
Larry Grun, 64—11 99th St., Rego Park, N.Y. 11374, and Max Bogner, 2 W. 47th St., New York, N.Y. 10036
Filed Aug. 27, 1973, Ser. No. 391,629
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—10 A



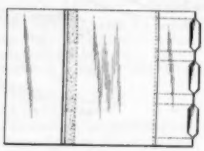
234,001
SEARCHLIGHT
Robert J. Strowe, Lake Hopatcong, and George E. Olson, Morris Plains, N.J., assignors to Streamlight, Inc., King of Prussia, Pa.
Filed May 7, 1973, Ser. No. 358,165
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 R



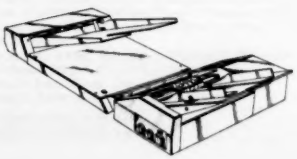
234,002
FLOODLIGHT
Fred M. Gore, Dallas, and Glen H. McReynolds, Jr., Houston, Tex., assignors to Esquire, Inc., New York, N.Y.
Filed Apr. 11, 1973, Ser. No. 350,152
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—20 K

234,003
COMBINED ENVELOPE AND SHEET FOR ADVERTISEMENT
Robert E. Katz, Livingston, N.J., assignor to Beatrice Foods Co., Chicago, Ill.
Filed Apr. 13, 1972, Ser. No. 243,900
Term of patent 14 years
Int. Cl. D19—*01*
U.S. Cl. D59—8

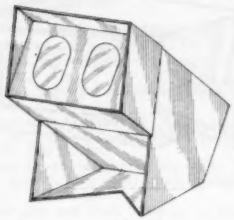
234,004
COMBINED ENVELOPE AND SHEET FOR ADVERTISEMENT
Robert E. Katz, Livingston, N.J., assignor to Beatrice Foods Co., Chicago, Ill.
Filed Apr. 13, 1972, Ser. No. 243,901
Term of patent 14 years
Int. Cl. D19—*01*
U.S. Cl. D59—8



234,005
AUTOMATIC COPY SHEET FEEDER FOR COPIERS
Ohiko Yagi and Toshio Shiina, Yokohama, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed May 14, 1973, Ser. No. 360,380
Term of patent 14 years
Int. Cl. D16—*04*
U.S. Cl. D61—1 Q

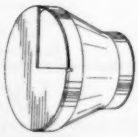


234,006
STEREO PHOTO VIEWER
Daniel Wang and Cynthia Wong, both of 7356 Ontario St., Vancouver 15, British Columbia, Canada
Filed Nov. 30, 1972, Ser. No. 310,802
Term of patent 7 years
Int. Cl. D16—*99*
U.S. Cl. D61—1 M

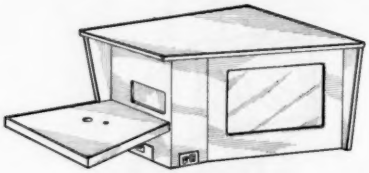


234,007
IMAGE SPLITTER
Jack V. Ritter, 14901 80th E., Puyallup, Wash. 98371
Filed June 18, 1973, Ser. No. 371,120
Term of patent 7 years
Int. Cl. D16—*05*
U.S. Cl. D61—1 E

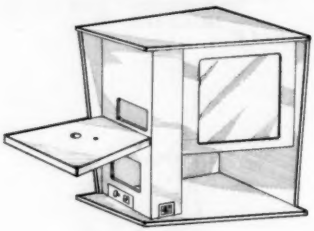
234,008
IMAGE SPLITTER
Jack V. Ritter, 14901 80th E., Puyallup, Wash. 98371
Filed June 18, 1973, Ser. No. 371,121
Term of patent 7 years
Int. Cl. D16—*05*
U.S. Cl. D61—1 E



234,009
MOTION PICTURE/SLIDE PROJECTOR CONSOLE
Allan B. Corderman, 161 Ramblewood Road, and Philip B. Flagler, 670 Chester Ave., both of Moorestown, N.J. 08057
Filed June 19, 1973, Ser. No. 371,359
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D61—1 N

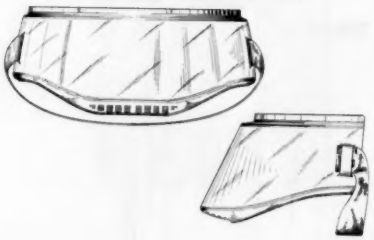


234,010
MOTION PICTURE/SLIDE PROJECTOR CONSOLE
Allan B. Corderman, 161 Ramblewood Road, and Philip B. Flagler, 670 Chester Ave., both of Moorestown, N.J. 08057
Filed June 19, 1973, Ser. No. 371,358
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D61—1 N



234,011
ENGINE MANIFOLD
Walter John Warneford, 60–66 Nicholson St., Potts Point, New South Wales, Australia
Filed Dec. 11, 1972, Ser. No. 314,183
Claims priority, application Australia Aug. 23, 1972
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D77—1 A

234,012
COMBINED OPTICAL AND NASAL AIR FILTER MASK
Robert A. Stegman, 2151 NE. 124th St., Miami, Fla. 33161
Filed May 14, 1973, Ser. No. 359,660
Term of patent 14 years
Int. Cl. D24—*99*; D2—*03*
U.S. Cl. D83—1 K



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 24TH DAY OF DECEMBER, 1974

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aagaard de Hidalgo, Antonia: *See—*
Hidalgo-Briceno, Miguel, 3,855,998.

AB Welin: *See—*
Nilsson, Per, 3,856,110.

Abbott Laboratories: *See—*
Hutchison, Arthur H.; and McMillian, Lonnie S., 3,857,065.
Lee, Cheuk Man, 3,856,958.

Abe, Eiichi: *See—*
Usui, Keizaburo; Abe, Eiichi; and Hayama, Isao, 3,856,121.

Abramoff, Charles, to Argus Chemical Corporation. Acrylonitrile-butadiene-styrene polymers having improved resistance to discoloration. 3,856,728, Cl. 260-23.70n.

ACF Industries, Incorporated: *See—*
Jourdan, Jerry W., 3,856,261.

Ackerman, James H., to Sterling Drug Inc. Iodinated 5-substituted-1,3-benzenediacrylic and -dipropionic acids. 3,856,853, Cl. 260-518.00a.

Acorn Engineering Company: *See—*
Morris, Earl L.; and Sally, Theodore J., 3,855,649.

Adachi, Shigeru: *See—*
Sato, Wasuke; Yamamoto, Seijiro; Kuwabara, Nobuaki; and Adachi, Shigeru, 3,856,025.

Adair, James C.; and Luke, Robert R., to Shell Oil Company. Apparatus for forming and loading a shot-hole. 3,856,095, Cl. 175-203.000.

Adam, Marie Henri Hubert, to Societe Anonyme l'Eclairage Technique. Reflector for light fixtures. 3,857,030, Cl. 240-103.00b.

Adams, Richard C.; Kachik, Robert H.; Pignocco, Arthur J.; and Rall, Waldo, to United States Steel Corporation. Apparatus for containing the molten reaction products of a reactive cladding process. 3,856,076, Cl. 164-332.000.

Adams, Robert B., to Moore Products Co. Flowmeter. 3,855,859, Cl. 73-194.00b.

Adams, Robert D.: *See—*
Rabett, Reginald George Edward, 3,856,107.

Addressograph-Multigraph Corporation: *See—*
Andrako, Thomas E., 3,855,969.

Adler, Jason A.; and Bartlett, David R., to Royal Industries. Magnetic position indicator. 3,857,089, Cl. 324-34.0ps.

Advanced Drainage Systems, Inc.: *See—*
Martin, Lawrence L.; Martin, Ronald C.; and Sixt, Marty E., 3,855,799.

Aerosols Control Corporation: *See—*
Perez, Manuel, 3,856,487.

Agence Nationale de Valorisation de la Recherche tour Aurore: *See—*
Cehovic, Georges; Gabbai, Albert; Marcus, Ilan; and Posternak, Theodore, 3,856,776.

Agency of Industrial Science & Technology: *See—*
Kodera, Yoshihide; Todo, Naoyuki; and Fukuda, Kenzo, 3,856,925.

Agfa-Gevaert N.V.: *See—*
Van Paesschen, August Jean; Herbots, Joseph Antoine; and Timmerman, Daniel Maurice, 3,856,530.

Aida, Yoshiaki: *See—*
Takahashi, Naoya; Aida, Yoshiaki; and Shimizu, Isoo, 3,856,740.

Aignesberger, Alois; and Rosenbauer, Hans-Gunter, to Suddeutsche Kalkstickstoff-Werk Aktiengesellschaft. Process for the production of improved cement. 3,856,542, Cl. 106-102.000.

Air Factors, Inc.: *See—*
Lambert, Robert R., 3,855,909.

Air Products and Chemicals, Inc.: *See—*
Cebalo, Tony, 3,856,503.
Delamater, George B.; and Milligan, Barton, 3,856,673.
Iacoviello, John G., 3,856,734.
Miller, Keith A., 3,856,457.

Aircraft Armaments, Inc.: *See—*
Barr, Irwin R.; and La Costa, Nicholas J., 3,855,900.

Aisin Seiki Kabushiki Kaisha: *See—*
Takayama, Katsuki, 3,856,047.

Ajinomoto Co., Inc.: *See—*
Fukuoka, Fumiko; Chihara, Goro; and Hamuro, Junji, 3,856,775.
Ishido, Yoshiharu; Yoshino, Teruo; Komura, Hajime; Suzuki, Katsumi; Yamasaki, Akihiro; and Okutsu, Masaru, 3,856,777.

Akiyama, Hiroyuki: *See—*
Miyamoto, Akira; Akiyama, Hiroyuki; Noguchi, Toshiaki; and Ohtsuka, Isao, 3,856,719.

Aktiebolaget Asea-Atom: *See—*
Suvanto, Antti; and Fries, Ake, 3,856,621.

Aktiebolaget Atomenergi: *See—*
Johnsson, Erik Borje, 3,856,338.

Aktiebolaget Electrolux: *See—*
Eriksson, Bolik Anders; and Vukotic, Milos, 3,855,666.
Schwartz, Osten, 3,855,665.

Akzona Incorporated: *See—*
Greven, Hendrik Marie, 3,856,770.
Henry, Charles Leroy; and McNeely, Gerald Willard, 3,856,753.

Alacchi, Georges. Walking supporting pier for coal mines. 3,855,802, Cl. 61-45.00d.

Alacchi, Georges. Shifting system for walking supports. 3,855,808, Cl. 61-45.00d.

Alaimo, Robert J.; and Goldenberg, Marvin M., to Morton-Norwich Products, Inc. 2-(Substituted amino)quinolizinium bromides. 3,856,803, Cl. 260-296.00b.

Alaimo, Robert J.; and Goldenberg, Marvin M., to Morton-Norwich Products, Inc. 2-(Substituted amino)quinolizinium bromides. 3,856,804, Cl. 260-296.00b.

Albrecht, Wilhelm; and Wulf, Helmut, to Daimler-Benz Aktiengesellschaft. Telescopic safety steering column for motor vehicles. 3,855,876, Cl. 74-492.000.

Albright & Wilson Limited: *See—*
Fothergill, Bernard Henry; Earle, Henry; and Kelly, William John, 3,856,269.

Aleksoff, Carl C.: *See—*
Cindrich, Ivan; Aleksoff, Carl C.; and Klooster, Alex, Jr., 3,856,409.

Alkaline Batteries Limited: *See—*
Hughes, Herbert Denis, 3,856,575.

All American Industries, Inc.: *See—*
Doolittle, Donald B., 3,856,236.

Allais, Andre: *See—*
Nedelec, Lucien; Guillaume, Jacques; and Allais, Andre, 3,856,910.

Allais, Andre; Meier, Jean; and Cerede, Jean, to Roussel Uclaf. Novel quinolines in the treatment of pain and inflammation. 3,856,909, Cl. 424-258.000.

Allais, Andre; Lilas, Les; and Nomine, Gerard, to Roussel-UCLAF. Novel indoles in the treatment of pain. 3,856,967, Cl. 424-274.000.

Allen, Archelaius Dawson; and Small, Fred, to Gullick Dobson Limited. Method of mining mineral. 3,856,356, Cl. 299-11.000.

Allen, Maurice, to Imperial Chemical Industries, Limited. Controlling setting of plasters. 3,856,543, Cl. 106-110.000.

Allen, Richard P.; and Nelson, Ronald D., to Battelle Development Corporation. Sputtered magnetic materials comprising rare-earth metals and method of preparation. 3,856,579, Cl. 148-103.000.

Allgaier, Rudolf: *See—*
Scholz, Hansjurgen; Brambilla, Luigi; and Allgaier, Rudolf, 3,856,103.

Allied Chemical Corporation: *See—*
Brandi, Adolph John; and Muthig, James Vincent, 3,855,778.
Chen, Ho-Sou; and Polk, Donald E., 3,856,513.
Kavesh, Sheldon, 3,856,074.
Taub, Bernard, 3,856,718.

Allis-Chalmers Corporation: *See—*
Hansen, Kenneth N., 3,855,875.

Allison, William D., to Ford Motor Company. Power steering device. 3,856,101, Cl. 180-79.20r.

Allman, Denis John; and Seager, Robert Vincent, to Allman, E., and Company Limited. Pumps. 3,856,437, Cl. 417-241.000.

Allman, E., and Company Limited: *See—*
Allman, Denis John; and Seager, Robert Vincent, 3,856,437.

Allmanna Svenska Elektriska Aktiebolaget: *See—*
Lundstrom, Harry, 3,857,083.

Allport, Maurice James, to Lucas Electrical Company Limited, The. Battery charging systems. 3,857,084, Cl. 322-28.000.

Alphin, Reevis S.; and Droppleman, David A. Anti-inflammatory agents. 3,856,962, Cl. 424-267.000.

Altherr, Russell George, to Amsted Industries Incorporated. Railway coupling. 3,856,155, Cl. 213-142.000.

Aluma-Form, Inc.: *See—*
Farmer, Marion R., 3,856,250.

Aluminum Company of America: *See—*
Howle, Clement Roger, 3,856,479.
Pohlenz, Elmer E., 3,855,759.
Snyder, Harry C., Jr., 3,856,920.

Alvarez, Bernard V. Multistage spring assembly. 3,856,288, Cl. 267-73.000.

Amada Company Limited: *See—*
Kawano, Susumu, 3,855,840.

Amado, Juan Jose, Jr. Apparatus for centrifugally casting hollow spheres. 3,856,452, Cl. 425-429.000.

Amagi, Yasuo; and Skiiki, Zenya, to Kureha Kagaku Kogyo Kabushiki Kaisha. Electrode and method of manufacture. 3,856,574, Cl. 136-120.0fc.

Amalgamated Dental Company, Limited, The: *See—*
Foster, John; and Henry, Ernest, 3,856,737.

American Chemical & Refining Company, Incorporated: *See—*
Rogers, Orris A.; Camp, Eldridge K.; and Borgmann, John P., 3,856,653.

American Colloid Company: *See—*
Langan, Maurice W., 3,855,747.

American Cyanamid Company: *See—*
Dusza, John Paul; Lindsay, Harry Lee; and Bernstein, Seymour, 3,856,838.
Ellestad, George Alfred; Martin, John Henry Edward James; and Porter, John Norman, 3,856,939.
Skrivan, Joseph Francis; and Chase, John Donald, 3,856,918.
Vitalis, Emil Alfred; and Tracey, Donald John, Jr., 3,856,722.
Waite, Jack Peter, 3,856,937.

American Express Investment Management Company, mesne: *See—*
Macovski, Albert, 3,856,986.

American Flange & Manufacturing Co., Inc.: *See—*
Jesevich, John; and Simkus, Vyto, 3,856,162.

American Home Products Corporation: *See—*
Freed, Meier E.; and Archibald, John L., 3,856,790.
Yardley, John P., 3,856,795.

American Potato Company: *See—*
Harmon, James F.; Johnston, Richard D.; Lach, John H.; von der Lieth, William H.; and Murphy, Thomas L., 3,855,913.

American Science & Engineering, Inc.: *See—*
Cobb, Carolus M., 3,857,033.

American Screen Process Equipment Company, mesne: *See—*
Kinney, Layton C.; and Tompkins, Edwin H., 3,855,928.

American Standard Inc.: *See—*
Bales, Emmett Robert, 3,855,946.
Dunham, Gerald Pitman, 3,855,648.

American Standard Inc., mesne: *See—*
Bell, Edward H.; and Bell, John R., 3,856,206.

American Trading and Production Corporation: *See—*
Seebinger, Frederick L., 3,856,253.

Amerikanische Gummiwerke AG: *See—*
Gorter, Werner, 3,856,067.

Amerola Products Corporation: *See—*
Merola, Anthony, 3,856,292.

Ameron, Inc.: *See—*
Loeber, Frederick W., 3,856,344.
Wells, Frank M.; and Black, Gordon J., 3,856,453.

Amidon, Alan B.: *See—*
Mammino, Joseph; and Amidon, Alan B., 3,856,692.

Amity Leather Products Company: *See—*
Dengel, Jan Peter, 3,856,063.

Amoco Production Company: *See—*
Blenkarn, Kenneth A., 3,855,656.

Amsted Industries Incorporated: *See—*
Altherr, Russell George, 3,856,155.
Mulcahy, Harry W., 3,855,942.

Andersen, Kare. Fluid seal for bearing assembly. 3,856,368, Cl. 308-187.200.

Anderson Company, The: *See—*
Wubbe, Leo J., 3,855,664.

Anderson, Donal C., to Ciba-Geigy Corporation. Method and compositions for preventing retention of placenta following induced parturition in cattle. 3,856,955, Cl. 424-243.000.

Anderson, Glenn W.: *See—*
Hutchison, Stanley O.; Anderson, Glenn W.; and Newby, Gordon L., 3,855,854.
Hutchison, Stanley O.; Anderson, Glenn W.; and Newby, Gordon L., 3,855,855.
Hutchison, Stanley O.; Anderson, Glenn W.; and Newby, Gordon L., 3,855,856.

Andrako, Thomas E., to Addressograph-Multigraph Corporation. Quality control of electrostatic image developer mix. 3,855,969, Cl. 118-637.000.

Andrews, Ronald A.: *See—*
Burns, William K.; and Andrews, Ronald A., 3,856,379.

Andrews, Theodore E., to Armstrong Cork Company. Conduit-slitting method. 3,855,886, Cl. 83-7.000.

Andriola, Achilles D.; Kuehn, Howard E.; Whittum, Warren C.; and Wink, Donald E., to USM Corporation. Drive for shell-type rolls. 3,855,681, Cl. 29-115.000.

Angerman, Albert Henry; and Moore, Carl Gordon, to Du Pont de Nemours, E. I., and Company. Production of anatase TiO_2 by the chloride process. 3,856,929, Cl. 423-613.000.

Anonima Castelli S.A.S.: *See—*
Piretti, Giancarlo, 3,856,147.

Antoniw, Walter W.: *See—*
Karcher, Thomas D.; and Antoniw, Walter W., 3,856,336.

Ao, Hideki: *See—*
Arimura, Katsuo; Kobayakawa, Toshihiro; Ao, Hideki; and Tsuda, Yoshiaki, 3,856,797.

Aoki, Katashi. Rotary type injection molding machine. 3,856,454, Cl. 425-451.000.

Aoki, Masaru: *See—*
Matsumoto, Takao; and Aoki, Masaru, 3,856,304.

Appleby, Paul E.: *See—*
Christie, Christopher E.; Appleby, Paul E.; and Tully, Frank R., 3,856,070.

Arai, Ryozo: *See—*
Kakizaki, Tadao; Ichimaru, Yoshiro; and Arai, Ryozo, 3,856,195.

Archibald, John L.: *See—*
Freed, Meier E.; and Archibald, John L., 3,856,790.

Arenson, A., Limited: *See—*
Duke, Dennis; Swain, Michael James; and Cracknell, Alan, 3,856,350.

Argus Chemical Corporation: *See—*
Abramoff, Charles, 3,856,728.

Arick, Robert E.; and Vogel, Ralph A., to Essex International, Inc. Push-pull stator winding apparatus and method. 3,856,221, Cl. 242-1.10r.

Arimura, Katsuo; Kobayakawa, Toshihiro; Ao, Hideki; and Tsuda, Yoshiaki, to Yoshitomi Pharmaceutical. 8-Aminoalkyl-3-oxo-1-thia-4,8-diazaspiro(4.5) decanes and analogs thereof. 3,856,797, Cl. 260-293.660.

Armitage, Brian P.: *See—*
Hunter, Susan E.; Boyce, Clive B. C.; Armitage, Brian P.; Haken, Pieter Ten; and Wagner, Willem M., 3,856,976.

Armstrong Cork Company: *See—*
Andrews, Theodore E., 3,855,886.

Armstrong, G. Leslie: *See—*
Lindberg, Richard S.; and Armstrong, G. Leslie, 3,856,360.

Arning, Klaus H.; and Rumpf, Robert J., to Ford Motor Company. Motor vehicle chassis subassembly. 3,856,323, Cl. 280-96.20r.

Arnold, Anthony Francis, to RCA Corporation. Method of electrolessly plating a metal on a body which includes lead. 3,856,565, Cl. 117-212.000.

Aron, Erwin, to Technical Processing, Inc. Processing aids for poly(vinyl chloride) resins. 3,856,547, Cl. 106-316.000.

Arroyo, Mario Saenz, to Articulos Medicos Mexicanos, S.A. Sphygmomanometer. 3,855,999, Cl. 128-2.05g.

Articulos Medicos Mexicanos, S.A.: *See—*
Arroyo, Mario Saenz, 3,855,999.

Arundel Corporation, The: *See—*
Foxton, Sidney Brian, 3,856,495.

Asada, Chiaki; and Watanabe, Toshiyuki, to Daido Seiko Kabushiki Kaisha. Cold workable and age-hardenable steel. 3,856,514, Cl. 75-124.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Omura, Etuzou; Minami, Toshio; and Kusunose, Tetsuhiro, 3,855,776.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Takahashi, Yasuo, 3,856,385.
Takeda, Hideomi; and Kawasaki, Harumi, 3,856,407.

Asao, Mamoru: *See—*
Ide, Fumio; Asao, Mamoru; Hasegawa, Akira; and Sasaki, Isao, 3,856,894.

Assmus, Friedrich, to Junghans, Gebruder, G.m.b.H., Firma. Attachment for the hands of a watch. 3,855,787, Cl. 58-126.00d.

Atkinson, Ronald Edward, to Procter & Gamble Company, The. Composition containing benzimidazole derivatives for softening rinse. 3,856,684, Cl. 252-8.800.

Atlantic Richfield Company: *See—*
Dieter, Jerry A.; Russell, Donald H.; and Sauer, Richard W., 3,856,720.

Atlas Chemical Industries, Inc.: *See—*
Kuehn, Erich, 3,856,830.

Auer, Eberhard: *See—*
Vogt, Wilhelm; Fischer, Edgar; and Auer, Eberhard, 3,856,755.

Aufzuge, R. Stahl, GmbH: *See—*
Fromme, Hans-Georg; and Lehberger, Erich, 3,855,941.

August Thyssen-Hutte Aktiengesellschaft: *See—*
Heynert, Gerhard; and Peters, Karl-Heinz, 3,856,509.

Auric Corporation: *See—*
Bick, Maurice; and Lochet, Jean A., 3,856,638.

Automobiles Peugeot: *See—*
Giordano, Jean-Louis, 3,856,260.

Avery, Leslie Ronald, to RCA Corporation. Cascade amplifier using complementary conductivity transistors. 3,857,105, Cl. 330-17.000.

Aylon, Norman N., to General Concrete Ltd. Masonry block and building panels. 3,855,752, Cl. 52-605.000.

Ayres, Ralph E., to Dow Chemical Company, The. Process for making expanded synthetic resinous beads. 3,856,904, Cl. 264-51.000.

Azarowicz, Edward N., to Bioteknika International, Inc. Microbial degradation of petroleum. 3,856,667, Cl. 210-11.000.

Baars, Nicolaas Joris, to U.S. Philips Corporation. Electronic switching arrangement having a touch contact. 3,857,100, Cl. 328-5.000.

Babb, Bruce E.: *See—*
Grisdale, Patrick J.; and Babb, Bruce E., 3,856,531.

Babcock & Wilcox Company, The: *See—*
Girardi, Vincent J., 3,855,901.

Bachman, Wesley J.: *See—*
Fathauer, George H.; and Bachman, Wesley J., 3,855,953.

Badberg, Melvin C., to Goodyear Tire & Rubber Company, The. Fuel tank filler neck breakaway assembly. 3,856,316, Cl. 280-5.00a.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Dunkelmann, Guenter; and Dehnert, Johannes, 3,856,772.
Kartte, Klaus; Fuchs, Hugo; Jockers, Kurt; Kahr, Kurt; and Meier, Hermann, 3,856,924.
Zeeh, Bernd; Jung, Johann; and Rentzea, Costin, 3,856,501.

Baer, Marcy L., to Glass, Marvin, & Associates. Flat stuffed doll and clothing combination. 3,855,730, Cl. 46-158.000.

Bain, James A. Flexible tube device. 3,856,051, Cl. 138-114.000.
Bair, Robert K., to Sterling Drug Inc. Process of preparing 1,4-dihydro-4-oxo-7-Q-3-unsubstituted -1,8-naphthyridines from cyclic alkylidenyl N-(6-Q-2 pyridyl)aminomethylenemalonates. 3,856,800, Cl. 260-296.00n.
Baker, Ethelbert J., Jr.: *See—*
Mallow, William A.; Owen, Richard A.; and Baker, Ethelbert J., Jr., 3,856,539.
Baker, James E. Hand climber accessory for tree-climbing-hunting platforms. 3,856,111, Cl. 182-135.000.
Bales, Emmett Robert, to American Standard Inc. Adjustable leg structure. 3,855,946, Cl. 108-144.000.
Ballard, Neiland H., to Graham, M. H., Corporation. Coffee maker. 3,856,435, Cl. 417-158.000.
Balsacq, Guy. Anti-fouling polyester resin. 3,856,743, Cl. 260-40.00r.
Bardsley Robert Francis: *See—*
Schoonmaker, Charles Donald; Hebel, Carl G.; and Bardsley Robert Francis, 3,855,912.
Baron, George B., to Marion Power Shovel Company, Inc. Power shovel. 3,856,161, Cl. 214-138.000.
Barr, Irwin R.; and La Costa, Nicholas J., to Aircraft Armaments, Inc. System for primer actuation of bolt. 3,855,900, Cl. 89-159.000.
Barritt, Max E.: *See—*
Papoi, Michael S.; and Barritt, Max E., 3,857,044.
Barten, Piet Gerard Joseph, to U.S. Philips Corporation. Colour television display apparatus provided with a picture display tube with electron beams generated in one plane. 3,857,057, Cl. 313-412.000.
Bartholomew, Allan E., to Myers Industries, Inc. Record storage rack. 3,856,145, Cl. 211-40.000.
Bartlett, David R.: *See—*
Adler, Jason A.; and Bartlett, David R., 3,857,089.
Bartlo, John S.; Safranski, Richard W.; Hart, Charles G.; and Wieseckel, David A. Automatic scale control system and methods. 3,856,097, Cl. 177-1.000.
Basic, Inc.: *See—*
Ozechoski, Anthony T., 3,856,994.
Bateman, John; and Gordon, David A., to Ciba-Geigy Corporation. Soluble polyimides derived from phenylindane diamines and dianhydrides. 3,856,752, Cl. 260-65.000.
Bates, John F.; Holmes, James J.; Paxton, Michael M.; and Straalsund, Jerry L., to United States of America, Atomic Energy Commission, mesne. Irradiation swelling resistant alloy for use in fast neutron reactors. 3,856,517, Cl. 75-128.00a.
Battelle Development Corporation: *See—*
Allen, Richard P.; and Nelson, Ronald D., 3,856,579.
Busch, Raymond A., 3,856,537.
Battle-Creek Packaging Machinery; Div. of Franklin Electric Subsidiaries, Inc.: *See—*
Walter, Frederick L.; and Holt, Ronald, 3,855,758.
Batzer, Hans: *See—*
Habermeiter, Jurgen; Buxbaum Lothar; and Batzer, Hans, 3,856,754.
Bauer, Alfred F., to NL Industries, Inc. Tilting molten metal dispenser with constant liquid head control. 3,856,183, Cl. 222-70.000.
Bauer, Kurt: *See—*
Hopp, Rudolf; and Bauer, Kurt, 3,856,815.
Baumers, Hans: *See—*
Waschulewski, Hans-Georg; Baumers, Hans; and Gerresheim, Dusseldorf, 3,856,426.
Baur, Leslie L.; and Hajduk, Thaddeus J., to Zenith Radio Corporation. Apparatus for automatically feeding CRT face panels to a panel processor. 3,856,129, Cl. 198-19.000.
Bausch & Lomb Incorporated: *See—*
Clark, James A., 3,855,737.
Baxter, Bobby G.; and Splitt, Theodore B., to Binkley Company, The. Retractable king pin. 3,856,330, Cl. 280-433.000.
Baxter Laboratories, Inc.: *See—*
Cullis, Herbert M.; Fordham, Willard E.; and Soodak, Charles I., 3,856,470.
Bayer Aktiengesellschaft: *See—*
Bodesheim, Ferdinand; Radlmann, Eduard; Schaffner, Heinz; and Nischk, Gunther, 3,856,738.
Corte, Herbert; Heller, Harold; Lange, Michael; and Netz, Otto, 3,856,715.
Daum, Werner; Scheinpflug, Hans; and Frohberger, Paul-Ernst, 3,856,811.
Margotte, Dieter; Vernaleken, Hugo; and Schnell, Hermann, 3,856,886.
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,856,798.
Schnurrbusch, Karl; and Preiss, Peter, 3,856,533.
Sirrenberg, Wilhelm; and Hammann, Ingeborg, 3,856,892.
Traenckner, Hans-Joachim; Rudolph, Hans; Rosenkranz, Hans Jurgen; Fuhr, Karl; and Patheiger, Manfred, 3,856,644.
Wagner, Kuno; Oertel, Gunter; Golitz, Hans Dietrich; and Quiring, Bernd, 3,856,756.
Bayne, Justin A.; and Knize, James J., to Moore Business Forms, Inc. Capstan detacher. 3,856,196, Cl. 225-100.000.
Beach, David Easton, to Eastman Kodak Company. Dead bulb sensing mechanism. 3,856,456, Cl. 431-92.000.
Beachem, Ronald G.: *See—*
Stark, Richard M.; and Beachem, Ronald G., 3,857,018.
Beal, Robert E.: *See—*
Moulton, Karl J.; and Beal, Robert E., 3,856,710.
Beck, Ivan: *See—*
Rakoczi, Jozsef; Beck, Ivan; Komlos, Endre; Petocz, Lujza; and Grasser, Katalin, 3,856,778.
Beck, Robert H.; and Rusch, Kenneth C., to Ford Motor Company. Means for fastening a structural member subject to creep. 3,856,424, Cl. 403-227.000.
Beckenbach, Karl. Inclined furnace for calcination and sintering of material particularly splint limestone. 3,856,463, Cl. 432-96.000.
Becker, Raymond M. Rotary internal combustion engine. 3,855,978, Cl. 123-44.00c.
Becker, Warren E.; Johnston, James D.; and Hildreth, Clarence L., to Ethyl Corporation. Purification of crude aluminum. 3,856,511, Cl. 75-68.00b.
Becking, Donald H., to Oxy Metal Finishing Corporation. Process for stripping nickel from articles and composition utilized therein. 3,856,694, Cl. 252-101.000.
Beckley, Charles Randolph. Folding chair. 3,856,345, Cl. 297-16.000.
Beckman Instruments, Inc.: *See—*
Siegelman, Abe; Quoss, Robert N.; and Pawlak, Raymond M., 3,856,536.
Beeferman, Dennis: *See—*
Esemplare, Pascal E.; and Beeferman, Dennis, 3,856,561.
Behn, Rudolf: *See—*
Hoppe, Lutz; and Behn, Rudolf, 3,856,742.
Beighley, Arthur F.: *See—*
Durkee, Jackson L.; Beighley, Arthur F.; and Dunlap, Donald E., 3,855,777.
Beiswanger, John P. G.: *See—*
Eiseman, Fred S., Jr.; Schenck, Leslie M.; and Beiswanger, John P. G., 3,856,895.
Bell and Howell Company: *See—*
Boyer, Harold E., 3,856,293.
Bell, Edward H.; and Bell, John R., to American Standard Inc., mesne. Thermosensitive flow control device. 3,856,206, Cl. 239-75.000.
Bell, John M.: *See—*
Mooney, Robert A.; and Bell, John M., 3,857,086.
Bell, John R.: *See—*
Bell, Edward H.; and Bell, John R., 3,856,206.
Bell, Richard A.; Wallace, Earl C.; and Winters, Ted W., to General Engineering & Manufacturing Corporation. Convertible and reversible seat structure. 3,856,347, Cl. 297-92.000.
Bell Telephone Laboratories, Incorporated: *See—*
James, Dennis Bryan; and McEowen, James Royce, 3,857,072.
Kim, You Song, 3,856,693.
Payne, Richard Steven; and Scavuzzo, Robert John, 3,856,578.
Seidel, Harold, 3,857,106.
Bellemann, Rudolf: *See—*
Sauerbrunn, Irmhild; and Bellemann, Rudolf, 3,855,811.
Beller, Laurence S., to Rockwell International Corporation. Inspection and analysis system. 3,857,052, Cl. 340-149.00r.
Beloit Corporation: *See—*
Davidson, George R.; and Gustafson, David R., 3,856,619.
Roell, William J., 3,856,618.
Belzidsky, David. Process for manufacturing stump socks and liners for prosthesis apparatus. 3,855,677, Cl. 28-72.00r.
Bender, Paul E.; and Loev, Bernard, to SmithKline Corporation. 3-Alkenyl dibenzo (b,d) pyrans. 3,856,822, Cl. 260-345.300.
Bender, Richard E.: *See—*
Schaefer, William E.; and Bender, Richard E., 3,856,603.
Bendix Corporation, The: *See—*
Howard, Donald W., 3,856,362.
Kasselmann, John T., 3,856,363.
Kwolek, John P.; and Thesier, Patrick A., 3,856,120.
Benner, Stanley G.; and Greene, Kenneth F., to Johns-Manville Corporation. Fiber-reinforced calcium silicate hydrate insulation. 3,856,544, Cl. 106-120.000.
Bens, Everett M.; and Holt, Lloyd J., to United States of America, Navy. Fluorescent visual augmentation composition. 3,856,550, Cl. 117-33.50r.
Benson, Donald Cyril. Devices for assisting in the bathing of babies and incapacitated persons. 3,855,644, Cl. 4-185.00b.
Bentley, Donald J., to Bentley Laboratories, Inc. Ventricle assembly for pulsatile-type pump. 3,855,995, Cl. 128-1.00d.
Bentley Laboratories, Inc.: *See—*
Bentley, Donald J., 3,855,995.
Benz, Michael. Animal trap. 3,855,724, Cl. 43-92.000.
Beregi, Laszlo; Hugon, Pierre; and Le Douarec, Jean-Claude, to Societe en nom collectif Science Union et Cie Societe Francaise de Recherche Medicale Suresnes. Amino acids and their derivatives. 3,856,857, Cl. 260-553.00e.
Bergstedt, Donald C.: *See—*
Field, Eugene P.; and Bergstedt, Donald C., 3,856,043.
Berner, Douglas G.: *See—*
Lynch, Thomas; Berner, Douglas G.; and Hynes, Frank R., 3,855,890.
Bernold, Jean P., 50% to Pfeiffer, Hans Walter. Tunnel structure. 3,855,801, Cl. 61-45.00r.
Bernstein, Seymour: *See—*
Dusza, John Paul; Lindsay, Harry Lee; and Bernstein, Seymour, 3,856,838.
Berthet, Aristide; and Blum, Jacques, to Institut de Recherches de la Siderurgie Francaise (IRSID). Apparatus for regulating molten metal supply. 3,856,182, Cl. 222-56.000.
Berthold, H., AG, Firma: *See—*
Linde, Hans, 3,856,394.
Bertolini, Natale: *See—*

Messina, Giuseppe; Lorenzoni, Loreno; and Bertolini, Natale, 3,856,878.

Bertolotti, Nino; Sabatini, Bruno; and Mocci, Giuseppe, to Centro Sperimentole Matallurgico S.p.A. Device for cooling hot rolled metallic strips. 3,856,281, Cl. 266-3.00r.

Bertus, Brent J.; and Walker, Darrell W., to Phillips Petroleum Company. Oxidative dehydrogenation. 3,856,879, Cl. 260-680.00e.

Bestehorn, Ute W. Mobile packaging and stacking devices. 3,856,322, Cl. 280-79.100.

Bethlehem Steel Corporation: *See*—
Durkee, Jackson L.; Beighley, Arthur F.; and Dunlap, Donald E., 3,855,777.

Betts, Paul J., to Inter Dyne. Cup sink for laboratory counter tops. 3,855,647, Cl. 4-187.00a.

Betz Laboratories, Inc.: *See*—
Brink, Robert H., Jr.; Shema, Bernard F.; and Swered, Paul, 3,856,961.

Bey, Michael P.: *See*—
Bey, Paul P.; and Bey, Michael P., 3,856,413.
Bey, Paul P.; and Bey, Michael P., 3,856,417.

Bey, Paul P.; and Bey, Michael P. Photographic color densitometer. 3,856,413, Cl. 356-175.000.

Bey, Paul P.; and Bey, Michael P. Photographic color densitometer. 3,856,417, Cl. 356-229.000.

Bick, Maurice; and Lochet, Jean A., to Auric Corporation. Bright gold electroplating bath and method of electroplating bright gold. 3,856,638, Cl. 204-43.00g.

Biddell, William G., to National Distillers and Chemical Corporation. Flame retardant compositions. 3,856,890, Cl. 260-897.00b.

Biden, Barry D.: *See*—
Otway, Clifford G.; and Biden, Barry D., 3,856,455.

Bildsoe, Jorgen S., mesne: *See*—
Krammer, Robert, 3,856,134.

Billeter, Henry R.: *See*—
Filliung, Jacques J.; Nelson, Axel B.; and Billeter, Henry R., 3,855,640.

Billeter, Henry R., to Sloan Valve Company. Bedpan rinser apparatus. 3,855,639, Cl. 4-7.000.

Billottet, Henri; Fechner, Patrice; Denoux, Robert; and Georgel, Jean, to Thomson-CSF. Loading device for a multibarrel weapon. 3,855,899, Cl. 89-47.000.

Bilofsky, Ruth C.; and Rogers, Howard G., to Polaroid Corporation. Diffusion transfer color film and process. 3,856,521, Cl. 96-3.000.

Binkley Company, The: *See*—
Baxter, Bobby G.; and Splitt, Theodore B., 3,856,330.

Bio-Digital Sciences, Inc.: *See*—
Nodine, John H.; Waite, John Herbert; Waite, Herbert; and Fletcher, Martin J., 3,856,930.

Bioteknika International, Inc.: *See*—
Azarowicz, Edward N., 3,856,667.

Bird, Martin J., to Persons-Majestic Mfg. Company. Cycle saddle with plastic base. 3,856,348, Cl. 297-195.000.

Birkenmeyer, Robert D., to Upjohn Company, The. Compositions and process. 3,856,943, Cl. 424-180.000.

Bissonette, Vernon Leon, to Eastman Kodak Company. Photographic elements and processes for providing tanned image records. 3,856,524, Cl. 96-35.000.

Bizerba-Werke Wilhelm Kraut KG: *See*—
Kuhnle, Ernst, 3,856,098.

Blachman, Arthur Gilbert, to International Business Machines Corporation. Multi-layer control of stress in thin films. 3,856,647, Cl. 204-192.000.

Black, Gordon J.: *See*—
Wells, Frank M.; and Black, Gordon J., 3,856,453.

Black, Hugh. Carrier means for automatically driven fasteners. 3,856,139, Cl. 206-340.000.

Blackburn, Dale W.; Devenney, Robert F.; and Mlynarski, John J., to Smithkline Corporation. Process for preparing desacetoxycephalosporanic acids from cephalosporanic acids and palladium oxide hydrate supported on alpha-cellulose useful in the process. 3,86,704, Cl. 252-430.000.

Blackwell, Jennings P., to Phillips Petroleum Company. Arylene sulfide polymer coating compositions. 3,856,560, Cl. 117-132.00b.

Blackwell, Jennings P., to Phillips Petroleum Company. Incorporation of high molecular weight fluorocarbon polymer in arylene sulfide polymer. 3,856,735, Cl. 260-29.60f.

Blake, Alexander, . Rolling diaphragm slip joint. 3,856,335, Cl. 285-286.000.

Blanchard, Burton L. Post-surgical drainage pouch retaining assembly. 3,856,011, Cl. 128-283.000.

Blanchard, Horace, to Nabisco, Inc. Wheeled display stand. 3,856,320, Cl. 280-47.350.

Blaw-Knox Company: *See*—
English, Ray H., 3,856,516.

Blenkarn, Kenneth A., to Amoco Production Company. Underwater buoy for a riser pipe. 3,855,656, Cl. 9-8.00r.

Blitch, William E., to Webline Corporation, The. Splash guard for bath tub showers. 3,855,642, Cl. 4-149.000.

Block, Bartley C. Instructional device and method for studying the gross anatomy of the human or animal organ systems. 3,855,714, Cl. 35-17.000.

Blodee, Leif: *See*—
Carlson, Arthur W.; and Blodee, Leif, 3,856,372.

Blonde, Pierre, to Societe anonyme dite: Orsymonde. Method of preparation of pharmaceutical products. 3,855,712, Cl. 34-5.000.

Bloom, Stanley M.; and Green, Milton, to Polaroid Corporation. Color diffusion transfer photographic elements comprising a sulfur-substituted tetrahydropyrimidine development inhibitor precursor and processes for their use. 3,856,520, Cl. 96-3.000.

Blozis, Peter P.: *See*—
Skubic, Leroy F.; and Blozis, Peter P., 3,855,944.

Blum, Jacques: *See*—
Berthet, Aristide; and Blum, Jacques, 3,856,182.

Bodesheim, Ferdinand; Radlmann, Eduard; Schaffner, Heinz; and Nischk, Gunther, to Bayer Aktiengesellschaft. Acrylonitrile polymers with reduced surface resistance. 3,856,738, Cl. 260-30.80r.

Boeing Company, The: *See*—
Forbis, John Conrad, 3,856,240.

Bogdanovich, Nick. Hitch. 3,856,331, Cl. 280-479.00r.

Bohac, Zdenek: *See*—
Vesely, Miloslav; and Bohac, Zdenek, 3,857,088.

Bojas, Edward J.; and Ward, Harold R., to Eaton Corporation. Hydrostatic transmission drive system. 3,855,792, Cl. 60-421.000.

Bolduc, Lee R., to Medtronic, Inc. Contraceptive apparatus and procedure. 3,855,996, Cl. 128-1.00r.

Boler, Leonard J.; and Desnick, Mandel L., to Cherne Industrial Inc. Modular liquid cooling spray units. 3,856,280, Cl. 261-90.000.

Boliden Aktiebolag: *See*—
Fahlstrom, Per Anders Herman Henningsson; and Gorling, Karl Goran, 3,856,506.

Booth, Dwight A. Foot-operated speed control for air-driven tool. 3,855,704, Cl. 32-28.000.

Boots Pure Drug Company Limited: *See*—
Oxley, Peter; and Housley, John Rosindale, 3,856,956.

Borchert, Edgar; and Sommer, Karl-Heinz, to Licentia Patent-Verwaltungs-GmbH. Method for producing homogeneously doped zones in semiconductor devices. 3,856,586, Cl. 148-186.000.

Borck, Joachim: *See*—
Dahm, Johann; Borck, Joachim; Nowak, Herbert; Simane, Zdenek; and Kayser, Detlev, 3,856,812.

Borgmann, John P.: *See*—
Rogers, Orris A.; Camp, Eldridge K.; and Borgmann, John P., 3,856,653.

Born, Billy Leon, to Stoelting Brothers Company. Wing type agitator. 3,856,273, Cl. 259-99.000.

Bosch, Robert, G.m.b.H.: *See*—
Habasch, Ahmed, 3,857,043.
Mayer, Hartmut, 3,855,974.

Bosman, Robert L.: *See*—
Ito, Yoichiro; and Bosman, Robert L., 3,856,669.

Bossert, Friedrich: *See*—
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,856,798.

Boswinkle, George; and Wheaton, Robert Bradford, to Whirlpool Corporation. Continuous wet oxidation system for the home. 3,856,672, Cl. 210-63.000.

Bott, John A. Automobile wind deflector assembly. 3,856,193, Cl. 224-42.10d.

Boudault, Robert; and Guion, Christian, to U.S. Philips Corporation. Safety circuit for the detection of the simultaneous actuation of two antagonizing units. 3,857,061, Cl. 315-130.000.

Boulanger, Henry J., to Texas Instruments Incorporated. Multi-position slide switch assembly with housing means holding common conductive rail in fixed abutting relationship with end terminals of fixed contact array. 3,857,000, Cl. 200-16.00d.

Boundy, Bruce K., to Westinghouse Electric Corporation. Power panel arrangement. 3,856,981, Cl. 174-48.000.

Bourton, Dennis Frederick, to Canterbury Precision Engineering, Limited. Heaters. 3,856,459, Cl. 432-58.000.

Boveri, Brown, & Company Limited: *See*—
Schweitzer, Samuel; and Ziffermayer, Georg, 3,856,472.

Bovril Limited: *See*—
Roberts, Peter Clive Buckley, 3,856,655.

Bowers, Michael R., to Yamaha International Corporation. Snowmobile adjustable suspension. 3,856,099, Cl. 180-5.00r.

Boyce, Clive B. C.: *See*—
Hunter, Susan E.; Boyce, Clive B. C.; Armitage, Brian P.; Haken, Pieter Ten; and Wagner, Willem M., 3,856,976.

Boyer, Harold E., to Bell and Howell Company. Automatic fold pan. 3,856,293, Cl. 270-68.00a.

BP Chemicals International Limited: *See*—
Walker, David John; and Branlard, Paul (said Walker, David John, assor. to), 3,856,730.

Braden, William B., Jr., to Texaco Inc. Miscible oil recovery process. 3,856,086, Cl. 166-274.000.

Bradley, Stuart: *See*—
Cragg, William Donald; and Bradley, Stuart, 3,856,995.

Bragdon, Robert W. Process for preparing substantially non-caking sodium chloride. 3,856,922, Cl. 423-268.000.

Braid, Milton, to Mobil Oil Corporation. Lubricant compositions containing derivatives of anthranilic acid. 3,856,690, Cl. 252-51.50a.

Brambilla, Luigi: *See*—
Scholz, Hansjurgen; Brambilla, Luigi; and Allgaier, Rudolf, 3,856,103.

Brand, Derek A.: *See*—
Imatt, Alexander; and Brand, Derek A., 3,855,991.

Brandau, Rainer, to Desitin-Werk Carl Klinke GmbH. Concentrate for infusion purposes containing 5,5-diphenylhydantoin sodium. 3,856,964, Cl. 424-273.000.

Brandi, Adolph John; and Muthig, James Vincent, to Allied Chemical Corporation. Process for forming an improved fiber tow by applying false twist to the tow. 3,855,778, Cl. 57-156.000.

Brandis, Helmut; Oppenheim, Rudolf; Lennartz, Gustav; and Kiesheyer, Heinrich, to Deutsche Edelstahlwerke GmbH. Ferritic stainless steel. 3,856,515, Cl. 75-126.00c.

Brandt, Gerlad B.; and Gottlieb, Milton, to Westinghouse Electric Corporation. Method and means for modulating light propagating in an optical waveguide by bulk acoustic waves. 3,856,378, Cl. 350-96.0wg.

Branlard, Paul: *See—*
Walker, David John; and Branlard, Paul, 3,856,730.

Braunstein, Harry R., to Westinghouse Electric Corporation. Transformer having a thyristor controlled circuit breaker. 3,857,068, Cl. 317-15.000.

Breslow, Jeffrey D.; and Dunn, Kathy A., to Glass, Marvin, & Associates. Three dimensional game apparatus. 3,856,308, Cl. 273-135.00r.

Bresson, Clarence R.; and Spaulding, Forrest D., to Phillips Petroleum Company. Modified asphalt hydraulic sealer. 3,856,732, Cl. 260-28.5as.

Breuer, Hermann, to Squibb, E. R., & Sons, Inc. Cephalosporin esters. 3,856,785, Cl. 260-243.00c.

Breveteam S.A.: *See—*
Colijn, Johannes Jakobus Vincent; and Tesch, Gunter Horst, 3,856,602.

Brewer, John C., to Garbalizer Corporation of America. Combination shredder and air-classification equipment. 3,856,217, Cl. 241-79.100.

Brewer, Ralph E.: *See—*
Lagrange, Don E.; Davis, Edward J.; Scheer, Eugene R.; Brewer, Ralph E.; and Hamilton, Curtis A., 3,857,042.

Bridgestone Tire Company Limited: *See—*
Hayakawa, Masaya; Harada, Iki; and Yamagami, Fumiyoshi, 3,856,135.

Brindley, Robert E., to Union Carbide Corporation. Display tray with merchandise-mounted card packages. 3,856,137, Cl. 206-73.000.

Brink, Miless L. Electrophoretic apparatus. 3,856,656, Cl. 204-299.000.

Brink, Robert H., Jr.; Shema, Bernard F.; and Swered, Paul, to Betz Laboratories, Inc. Slime control composition containing bromonitrostyrene and its use. 3,856,961, Cl. 424-263.000.

Brinkman, Willem, to Holec N.V. Injector. 3,855,982, Cl. 123-139.0am.

Brinton, Bernard E.; and Schorn, Ludwig; deceased (by Schorn, Hedwig; administratrix), to Robertson Bauelemente G.m.b.H. Acoustical ventilator. 3,855,910, Cl. 98-42.000.

Briscoe, David. Speedometer attachment which permits a direct reading in kilometers per hour from a miles per hour scale and conversely. 3,855,958, Cl. 116-116.000.

British Columbia Research Council: *See—*
McElroy, Roderick O.; and Duncan, Douglas W., 3,856,913.

British Insulated Callender's Cables Limited: *See—*
Puckowski, Robert Tadeusz; Hagger, John Michael Richards; and Elder, Keith Robert McMillan, 3,856,980.

British Iron and Steel Research Association, The: *See—*
Reed, Geoffrey Ronald, 3,856,141.

British Oxygen Company Limited, The, mesne: *See—*
Stanbank, Derek James; Leigh, Roland Albert; and Gibson, Geoffrey Moorhouse, 3,856,696.

Britten, George C., to Manbritt Industries, Inc. Mold construction. 3,856,450, Cl. 425-398.000.

Broggi, Allen J.: *See—*
Ulrich, Henri; Stuber, Fred A.; and Broggi, Allen J., 3,856,523.

Brookfield, Myron B.: *See—*
Krammer, Robert, 3,856,134.

Brown, Hart; and Puckett, Howard N., to Tool & Instruments Associates, Inc. Valve. 3,856,046, Cl. 137-625.280.

Brown, Henry, to Oxy Metal Finishing Corporation. Formation of the rotor track of a rotary engine. 3,856,635, Cl. 204-9.000.

Brown, Kenneth H.: *See—*
Radlove, Sol B.; Ravve, Abraham; and Brown, Kenneth H., 3,856,744.

Brudy, Peter E., to Dominion Auto Accessories Limited. Bundling strap. 3,855,670, Cl. 24-16.0pb.

Brug, James E.; and Heidelberg, Eric X., to Owens-Illinois, Inc. Recovery of gold from solution in aqua regia. 3,856,507, Cl. 75-.50a.

Bruneel, Charles H., 45% to Bruneel, Emerance C. and 10% to Champine, Hubert. Automobile floor mat construction. 3,856,610, Cl. 161-43.000.

Bruneel, Emerance C.: *See—*
Bruneel, Charles H., 3,856,610.

Bryant, Robert G.: *See—*
Neunherz, Herbert W.; Bryant, Robert G.; and Flye, Donald R., 3,855,650.

Brychta, Emil John: *See—*
Horsey, Robert W.; and Brychta, Emil John, 3,855,767.

Brzozowski, Zbigniew K.; Porejko, Stanislaw; Kaczorowski, Janusz; and Kielkiewicz, Jedrzej, to Politechnika Warszawska. Process for the manufacture of chemical resistant polyarylate films and coatings. 3,856,556, Cl. 117-62.000.

Buchele, Wesley F.; and Mahmoud, Ali R., to Iowa State University Research Foundation, Inc. Shelling mechanism. 3,856,022, Cl. 130-6.000.

Buckland, Paul S., to Goodyear Tire & Rubber Company, The. Tool for inserting a repair plug and patch in a wire cord tire. 3,855,881, Cl. 81-15.700.

Buckley, Donald J., Sr.: *See—*
Thaler, Warren A.; Buckley, Donald J., Sr.; and Kennedy, Joseph P., 3,856,763.

Buckman, John D.; and Pera, John D., to Buckman Laboratories, Inc. Potassium N-hydroxymethyl-N-methyldithiocarbamate. 3,856,851, Cl. 260-513.500.

Buckman Laboratories, Inc.: *See—*
Buckman, John D.; and Pera, John D., 3,856,851.

Bugaut, Andree: *See—*
Kalopissis, Gregoire; and Bugaut, Andree, 3,856,810.

Bulkley, Clifford T., to Dunham-Bush, Inc. Energy recovery system for oil injected screw compressors. 3,856,493, Cl. 62-401.000.

Bundschuh, John J.; Roman, Robert J.; and Burndshuh, John J., to Eastman Kodak Company. Cinematographic projectors or the like and cartridges for use therewith. 3,856,234, Cl. 242-189.000.

Bunyan, Thomas Walter. Engines, pumps and motors. 3,855,903, Cl. 91-480.000.

Burch, Homer A.: *See—*
Wright, George C.; Burch, Homer A.; and Goldenberg, Marvin M., 3,856,825.

Burcher, Ernest E.: *See—*
Sinclair, Archibald R.; Burcher, Ernest E.; and Katzberg, Stephen J., 3,857,031.

Burdick, Robert E., to Rolair Systems, Inc. Rotatable building structure having fluid bearings. 3,855,755, Cl. 52-65.000.

Burlet, Jean-Etienne, to Centre Technique Industriel dit: Institut Textile de France. Method of and apparatus for producing yarn. 3,855,772, Cl. 57-58.950.

Burlington Industries, Inc.: *See—*
Lee, Billy M., 3,855,822.

Burmeister, Karl-Heinz, to Ipsen Industries International, Gesellschaft mit beschrankter Haftung. Radiating tube burner. 3,855,993, Cl. 126-91.00a.

Burndshuh, John J.: *See—*
Bundschuh, John J.; Roman, Robert J.; and Burndshuh, John J., 3,856,234.

Burnett, Robert L., to Chevron Research Company. Disproportionation of saturated hydrocarbons employing a catalyst that comprises platinum and tungsten. 3,856,876, Cl. 260-676.00r.

Burns, William K.; and Andrews, Ronald A., to United States of America, Navy. Optical mixing device employing noncritical phase matching in waveguides. 3,856,379, Cl. 350-96.0wg.

Burrell, Alfred A. Stand for storing, indexing and displaying stock. 3,856,370, Cl. 312-118.000.

Burress, George T., to Mobil Oil Corporation. Xylene isomerization. 3,856,873, Cl. 260-668.00a.

Burroughs Corporation: *See—*
Merlino, Eugene L., Jr.; Naeyaert, Roger S., Jr.; and Ellis, Jonas, 3,856,984.
Sims, Dewey M., Jr., 3,856,998.

Burton Parsons Chemicals, Inc.: *See—*
Rankin, Billy F., 3,856,919.

Busam, Donald H., to Interlake Inc. Self adjusting track extension. 3,855,935, Cl. 104-48.000.

Busch, Raymond A., to Battelle Development Corporation. Boron-silicon composition and method of making same. 3,856,537, Cl. 106-55.000.

Bush, Richard W.: *See—*
Dighe, Shrikant V.; and Bush, Richard W., 3,856,858.

Business Electronics, Inc.: *See—*
Stark, Richard M.; and Beachem, Ronald G., 3,857,018.

Buta, John J.: *See—*
Mauck, Robert J., 3,856,168.

Butler, Walter J.: *See—*
Puckette, Charles McD.; and Butler, Walter J., 3,857,101.

Buxbaum Lothar: *See—*
Habermeiter, Jurgen; Buxbaum Lothar; and Batzer, Hans, 3,856,754.

Buzzi, Leo: *See—*
Meyer, Gerald; and Buzzi, Leo, 3,855,697.

Byerly, Robert M., to Viking Industries, Inc. Pipe mounting clamp. 3,856,245, Cl. 248-54.00r.

Bylund, Don M., to Deering Milliken Research Corporation. Sealed edge cutting method. 3,856,599, Cl. 156-88.000.

Byram, James Warren, to International Business Machines Corporation. Web winding spool. 3,856,229, Cl. 242-71.800.

Calcagno, Benedetto: *See—*
Cocuzza, Giacchino; and Calcagno, Benedetto, 3,856,484.

Caldecourt, Victor J., to Dow Chemical Company, The. Electrical bridge element assembly for corrosion measurement. 3,857,094, Cl. 324-65.0cr.

Caldwell, Edward N., to Robertshaw Controls Company. Control device having improved adjustment indicating means and parts therefor or the like. 3,855,960, Cl. 116-124.00r.

Caldwell, Edward N., to Robertshaw Controls Company. Pneumatically operated diverting relay construction and system utilizing the same or the like. 3,856,044, Cl. 137-625.500.

Callaghan, John W.; and Johnson, David F. Traction device. 3,856,068, Cl. 152-226.000.

Camp, Eldridge K.: *See—*

Rogers, Orris A.; Camp, Eldridge K.; and Borgmann, John P., 3,856,653.

Campagna, Edward R.; Hardy, Donald F.; Palmer, Thomas W., III; Daugherty, Barney R.; and Letawa, John R., to Dart Industries, Inc. Glassware coating apparatus and process therefor. 3,856,498, Cl. 65-60.000.

Campagnuolo, Carl J.; and Curto, Paul A., to United States of America, Army. Self-governing turbine speed limiter. 3,856,432, Cl. 416-45.000.

Campbell, Alexander J.: *See—*
Foster, George W.; and Campbell, Alexander J., 3,855,641.

Campman, Clemens Adrianus Maria. Method and apparatus for producing pile fabric. 3,856,597, Cl. 156-72.000.

Canada, Her Majesty the Queen in the right of, as represented by the Minister of National Defence: *See—*
Kuchn, Lorne A.; and McHattie, Lloyd E., 3,855,863.

Canadian International Paper Company: *See—*
MacDonald, Richard C.; and Martin, Noel E., 3,856,012.

Canalizo, Carlos R., to Otis Engineering Corporation. Locking devices. 3,856,081, Cl. 166-123.000.

Candid Logic, Inc.: *See—*
Tann, Lewis H.; Carroll, Robert J.; and Lipke, Donald L., 3,855,708.

Canon Kabushiki Kaisha: *See—*
Hosoe, Kazuya; and Matsumoto, Seiichi, 3,856,399.

Canoy, Grant. Fly trap apparatus. 3,855,727, Cl. 43-65.000.

Canterbury Precision Engineering, Limited: *See—*
Bourton, Dennis Frederick, 3,856,459.

Caprio, Lawrence A.: *See—*
Gerson, Ronald L.; and Caprio, Lawrence A., 3,855,700.

Carithers, Val G., to Reynolds Metals Company. Alumina catalyst support. 3,856,708, Cl. 252-463.000.

Carlson, Arthur W.; and Blodee, Leif, to Sheldon, E. H., and Company. Laboratory working sink station. 3,856,372, Cl. 312-209.000.

Carlson, Norman R.; and Zitelli, William E., to Westinghouse Electric Corporation. D.C. modules employed for simulating electric power system for loadflow and transient stability studies. 3,857,027, Cl. 235-151.210.

Carlson-Dimond & Wright, Inc.: *See—*
Wright, James T., 3,855,920.
Wright, James T., 3,855,921.

Carmin, Dorrie L., Jr.: *See—*
United States of America, National Aeronautics and Space Administration, 3,856,534.

Carpenter, Charles W., to Hercules Incorporated. Apparatus for bonding pile yarns onto rigid thermoplastics. 3,856,605, Cl. 156-436.000.

Carre, Jean-Jacques, to Societe Anonyme D.B.A. Hydraulic power control device. 3,855,905, Cl. 91-384.000.

Carrier Corporation: *See—*
Damratowski, Leonard P., 3,855,788.

Carroll, Robert J.: *See—*
Tann, Lewis H.; Carroll, Robert J.; and Lipke, Donald L., 3,855,708.

Carter, Fay G. Cover with replaceable covering material. 3,856,176, Cl. 220-200.000.

Case, Carl J., to Salem Tool Company, The. Spoil ejector for horizontal earth augering machine. 3,856,093, Cl. 173-152.000.

Case, J. I., Company: *See—*
Lamer, Gerald P., 3,856,151.
Seaberg, David H., 3,856,163.

Casio Computer Co., Ltd.: *See—*
Kashio, Toshio, 3,855,780.

Castner, Charles S.: *See—*
Vick, James A.; and Castner, Charles S., 3,856,936.

Cataluppi, Angelo: *See—*
Porta, Paolo Della; Cataluppi, Angelo; Ferrario, Bruno; and Montalenti, Paolo, 3,856,709.

Caterpillar Tractor Company: *See—*
Cryder, John R.; and Wirtz, Edward A., 3,856,041.

Caudill, Kent H. Electrified trolley track. 3,855,937, Cl. 104-94.000.

C.A.V. Limited: *See—*
Leonard, Gordon Harris; and Ramshaw, Anthony John, 3,857,062.

Caves, Lawrence C., Jr.: *See—*
Patterson, Merle W.; and Caves, Lawrence C., Jr., 3,855,745.

Cavitt, Stanley Bruce, to Jefferson Chemical Company, Inc. Process for oxidizing olefins using hydrocarbon soluble phosphorus-modified molybdenum catalysts. 3,856,826, Cl. 260-348.50v.

Cavitt, Stanley Bruce, to Jefferson Chemical Company, Inc. Silicon containing molybdenum catalysts. 3,856,827, Cl. 260-348.50v.

Cebalo, Tony, to Air Products and Chemicals, Inc. Herbicidal method and compositions. 3,856,503, Cl. 71-90.000.

Cecil Equipment Co., Inc.: *See—*
Cecil, Shelby; and Riggs, Dean D., 3,857,080.

Cecil, Shelby; and Riggs, Dean D., to Cecil Equipment Co., Inc. Proportional control for guidance systems, and the like. 3,857,080, Cl. 318-681.000.

Cehovic, Georges; Gabbai, Albert; Marcus, Ilan; and Posternak, Theodore, to Agence Nationale de Valorisation de la Recherche tour Aurore. Derivatives of cyclo adenosine-3-,5-phosphoric acid and their preparation. 3,856,776, Cl. 260-211.50r.

Celanese Corporation: *See—*
McGinnis, Paul H., Jr., 3,856,612.

Celesti, Louis Emile, to Cincinnati Milacron Inc. Injection mold for making hollow bodies having a mold locking core. 3,856,256, Cl. 249-66.000.

Cenco Medical/Health Supply Corporation: *See—*
Sauer, Philip H., 3,855,997.

Centre de Recherche Industrielle du Quebec Sanite-Foy: *See—*
Palmer, Joseph; and Handfield, Guy, 3,856,512.

Centre Technique Industriel dit: Institut Textile de France: *See—*
Burlet, Jean-Etienne, 3,855,772.

Centro Sperimentole Matallurgico S.p.A.: *See—*
Bertolotti, Nino; Sabatini, Bruno; and Mocci, Giuseppe, 3,856,281.

Cerede, Jean: *See—*
Allais, Andre; Meier, Jean; and Cerede, Jean, 3,856,909.

Cesari and McKenna: *See—*
Legere, Allan E., 3,856,027.

Champine, Hubert: *See—*
Bruneel, Charles H., 3,856,610.

Chancholle, Andre Robert: *See—*
Perisse, Pierre; Perisse, Jean Maurice Francois; and Chancholle, Andre Robert, 3,856,017.
Perisse, Pierre; Perisse, Jean Maurice Francois; and Chancholle, Andre Robert, 3,856,018.

Chand, Ramesh, to Ecology Board, Inc. Gas emitting device. 3,856,204, Cl. 239-34.000.

Chandler Evans Inc.: *See—*
Gebelein, Edward F., Jr., 3,857,081.

Chandra, Grish, to Dow Corning Limited. Silicon-containing complexes. 3,856,837, Cl. 260-429.00r.

Chang, Robert C. C., to Sun Oil Company of Pennsylvania. Pneumatic pressure control system. 3,856,486, Cl. 55-210.000.

Chapman, Charles C., to Phillips Petroleum Company. Fractionator and method of fractionating. 3,856,629, Cl. 202-158.000.

Chappell, Gilford A., to Exxon Research and Engineering Company. Oxygen-promoted thermal hydrocarbon conversion processes. 3,856,663, Cl. 208-209.000.

Charles, Richard J.: *See—*
Smeggil, John G.; and Charles, Richard J., 3,856,580.
Smeggil, John G.; and Charles, Richard J., 3,856,581.
Smeggil, John G.; and Charles, Richard J., 3,856,582.

Charlett, Dante J. Flower cutter. 3,855,699, Cl. 30-135.000.

Chartet, Andre, to Societe Anonyme des Usines Chausson. Method of soldering together an aluminum part and a ferrous or cuprous metal part. 3,855,682, Cl. 29-157.30r.

Chase, John Donald: *See—*
Skrivan, Joseph Francis; and Chase, John Donald, 3,856,918.

Chase of California: *See—*
Chase, Willis E., 3,855,893.

Chase, Willis E., to Chase of California. Electronic organ employing multiple waveform tone generators and chiff generators. 3,855,893, Cl. 84-1.240.

Chemische Werke Huls Aktiengesellschaft: *See—*
Menzel, Gerhard; Seidel, Eckhard; and Jaenichen, Gunther, 3,856,726.

Chen, Ho-Sou; and Polk, Donald E., to Allied Chemical Corporation. Novel amorphous metals and amorphous metal articles. 3,856,513, Cl. 75-122.000.

Chen, Nai Yuen: *See—*
Weisz, Paul B.; Chen, Nai Yuen; and Lucki, Stanley J., 3,855,980.

Cheng, Tai Chun: *See—*
Halasa, Adel F.; and Cheng, Tai Chun, 3,856,768.

Chermin, Hubertus Mathias Jozef, to U.S. Philips Corporation. Glow discharge tube ignition circuit for electric discharge tube. 3,857,060, Cl. 315-99.000.

Cherne Industrial Inc.: *See—*
Boler, Leonard J.; and Desnick, Mandel L., 3,856,280.

Chervenak, Michael C.: *See—*
Wolk, Ronald H.; and Chervenak, Michael C., 3,856,658.

Chevron Research Company: *See—*
Burnett, Robert L., 3,856,876.
Hutchison, Stanley O.; Anderson, Glenn W.; and Newby, Gordon L., 3,855,854.
Hutchison, Stanley O.; Anderson, Glenn W.; and Newby, Gordon L., 3,855,855.
Hutchison, Stanley O.; Anderson, Glenn W.; and Newby, Gordon L., 3,855,856.
Lowe, Warren, 3,856,687.

Chicago Pneumatic Tool Company: *See—*
Moehrbach, Rudolf E., 3,856,439.

Chick, Douglas Richard, to National Research Development Corporation. Generation of beams of charged particles. 3,857,090, Cl. 324-47.000.

Chihara, Goro: *See—*
Fukuoka, Fumiko; Chihara, Goro; and Hamuro, Junji, 3,856,775.

Chihara, Hiroyuki; and Ushiyama, Yoshito, to Kabushiki Kaisha Suwa Seikosha. Step motor mechanism for electronic timepiece. 3,855,781, Cl. 58-4.00a.

Chikama, Toshio, to Kabushiki Kaisha Machida Seisakusho. Endoscope. 3,856,000, Cl. 128-6.000.

Chlystun, Walter K. Container with collapsible pouring spout and self opening vent hole. 3,856,187, Cl. 222-529.000.

Christen, Jack P., to Outers Laboratories, Inc. Knock-down electric food smoker. 3,856,374, Cl. 312-263.000.

Christie, Christopher E.; Appleby, Paul E.; and Tully, Frank R., to Goodyear Tire & Rubber Company, The. Transverse flash breaking in tire manufacture. 3,856,070, Cl. 157-13.000.

Christmann, Harold F.: *See—*
Woskow, Marvin Z.; and Christmann, Harold F., 3,856,880.

Chromalloy American Corporation: *See—*
Hodgson, James H., 3,856,210.

Chung, Tae H.; Dillon, Michael L.; and Lines, Gregory L., to Upjohn Company, The. Process for hydrogenation of di(4-aminophenyl) methane with a radium catalyst. 3,856,862, Cl. 260-563.00b.

CH_2O, Inc.: *See—*
Courtright, Burr, 3,856,039.

Ciba-Geigy AG: *See—*
Dobinson, Bryan; and Winterbottom, Kenneth, 3,856,464.
Nikles, Erwin; Dittrich, Volker; and Pinter, Ladislaus, 3,856,816.
Nikles, Erwin; Dittrich, Volker; and Pinter, Ladislaus, 3,856,968.

Ciba-Geigy Corporation: *See—*
Anderson, Donal C., 3,856,955.
Bateman, John; and Gordon, David A., 3,856,752.
Dexter, Martin; and Knell, Martin, 3,856,748.
Habermeiter, Jurgen; Buxbaum Lothar; and Batzer, Hans, 3,856,754.
Herzog, Alexis, 3,856,950.
Huber-Emden, Helmut; and Schafer, Paul, 3,856,849.
Kristiansen, Odd; and Gubler, Kurt, 3,856,948.
Riccio, Pasquale R., 3,856,185.

Ciba-Geigy Limited A.G.: *See—*
Hubele, Adolf, 3,856,973.

Ciba-Geigy Marienberg GmbH: *See—*
Eggensperger, Heinz; Franzen, Volker; Diehl, Karl-Heinz; and Kloss, Wilfred, 3,856,846.

Cicognani, Marion, to Industrie Pirelli S.p.A. Process for manufacturing toothed belts. 3,856,907, Cl. 264-254.000.

Cimarusti, Christopher Michael: *See—*
Hauck, Frederic Peter; and Cimarusti, Christopher Michael, 3,856,818.

Cina, Baruch M., to Israel Aircraft Industries Ltd. Reducing the susceptibility of alloys, particularly aluminum alloys, to stress corrosion cracking. 3,856,584, Cl. 148-159.000.

Cincinnati Milacron Inc.: *See—*
Celesti, Louis Emile, 3,856,256.
Mous, Gerarous Adrianus, 3,857,026.

Cincinnati Milacron-Heald Corporation: *See—*
Wake, John A.; and St. Andre, Arthur F., 3,857,079.

Cincinnati Mine Machinery Co., The: *See—*
Krekeler, Claude B., 3,856,358.
Krekeler, Claude B., 3,856,359.

Cindrich, Ivan; Aleksoff, Carl C.; and Klooster, Alex, Jr., to KCA Laser Systems. Laser alignment device. 3,856,409, Cl. 356-138.000.

Cir-Cut Corporation: *See—*
Dilello, Carmen J.; and Hart, David K., 3,855,892.

Ciuffini, Anthony J.: *See—*
Taylor, Thomas W.; Ciuffini, Anthony J.; and Gerace, Paul L., 3,856,548.

Clamen, Allen; and Dasinger, Bruce L., to Exxon Research and Engineering Company. Fermentation process for the simultaneous production of protein and bio polymers. 3,856,626, Cl. 195-49.000.

Clark, Charles F. Drinking fountain attachment. 3,856,203, Cl. 239-27.000.

Clark, Dennis Edward; and Hutton, Robert Christopher. Process for the preparation of sodium salt of ampicillin. 3,856,779, Cl. 260-239.000.

Clark Equipment Company: *See—*
Swanson, Allan R., 3,856,361.

Clark, Glenn W.; and Richardson, Oliver F., to Richardson, Oliver F. and Fleshman, Shirley. Electrically heated heat sealing implement. 3,857,015, Cl. 219-244.000.

Clark, James A., to Bausch & Lomb Incorporated. Automatically adjustable blocking device. 3,855,737, Cl. 51-216.00r.

Claycomb, Jackson R., to Schlumberger Technology Corporation. Well bore force-measuring apparatus. 3,855,853, Cl. 73-151.000.

Claycomb, Jackson R., to Schlumberger Technology Corporation. Force-measuring apparatus for use in a well bore pipe string. 3,855,857, Cl. 73-151.000.

Clayton Manufacturing Company: *See—*
Cline, Edwin L., 3,855,852.

Clemett, Edwin F., Jr.: *See—*
Kavthekar, Keshav S.; and Clemett, Edwin F., Jr., 3,857,004.

Cline, Edwin L., to Clayton Manufacturing Company. Apparatus for controlling the characteristics of magnetically operated friction type power absorption devices. 3,855,852, Cl. 73-135.000.

Cline, Jay D.; and Grant, Don S., to Dayton Aircraft Products, Inc. Electrostatic charge sensing probe. 3,857,066, Cl. 317-2.00r.

Closs, Felix H.; Mueller, Hans R.; and Wild, Daniel, to International Business Machines Corporation. Time division multiplex exchange. 3,856,993, Cl. 179-15.0at.

Cobb, Carolus M., to American Science & Engineering, Inc. Detecting malignant cells. 3,857,033, Cl. 250-303.000.

Cocuzza, Giacchino; and Calcagno, Benedetto, to Societa' Italiana Resine S.I.R. S.p.A. Process for recovering ethylene oxide. 3,856,484, Cl. 55-48.000.

Coe Manufacturing Company, The: *See—*
Fields, Fred W., 3,856,600.

Cohen, Noal, to Hoffman-La Roche, Inc. Synthesis of A-ring aromatic steriods. 3,856,864, Cl. 260-590.000.

Colas, Francois; and Gregorian, Claude. Track element for linear motor vehicles and a track using such an element. 3,856,202, Cl. 238-122.000.

Colgate-Palmolive Company: *See—*
Fischer, Charles F., 3,856,449.

Colijn, Johannes Jakobus Vincent; and Tesch, Gunter Horst, to Breveteam S.A. Method of producing non-woven textile fiber products having a relief-like structure. 3,856,602, Cl. 156-148.000.

Collette, John Wilfred; Ro, Rolland Shih-Yuan; and Sonnenberg, Fred Max. Functionally substituted terpolymers of α-olefins. 3,856,765, Cl. 260-80.730.

Colombo, Peter: *See—*
Steinberg, Meyer; Colombo, Peter; and Farber, Gerald, 3,856,054.

Columbia Broadcasting System, Inc.: *See—*
McMann, Renville H.; and Peit, Joseph G., 3,856,987.

Columbia Marking Tools, Inc.: *See—*
Krembel, Frank, Jr., 3,855,922.

Combustion Engineering, Inc.: *See—*
Young, Lester Charles, 3,855,796.

Comfort Care Products: *See—*
Cox, Wayne H., 3,856,004.

Commiant, Michel, to Compagnie generale des Isolants (Cogebi). Method for stowing-away cassettes in a suitable holder. 3,856,369, Cl. 312-107.000.

Compagnie generale des Isolants (Cogebi): *See—*
Commiant, Michel, 3,856,369.

Comstock, Alfred E. Color photo processing apparatus. 3,856,395, Cl. 354-299.000.

Comstron Corporation: *See—*
Juels, Ronald J., 3,857,097.

Con-Technik GmbH, mesne: *See—*
Prange, Horst, 3,855,663.

Conax Corporation: *See—*
Fisher, Edward; Rautio, Wilbur S.; Jankowiak, Roman; and Natell, Richard W., 3,856,983.

Concorde Fibers, Inc.: *See—*
Norwood, David W., 3,856,445.

Connell, Gordon Sidney, to Formflo Limited. Rolling machines. 3,855,833, Cl. 72-91.000.

Consolidated Natural Gas Service Co. Inc.: *See—*
Tarman, Paul B.; and Massey, Lester G., 3,856,928.

Consumat Systems, Inc.: *See—*
Hughes, Carroll T., Jr.; and Fishback, James K., 3,855,950.

Continental Can Company: *See—*
Radlove, Sol B.; Ravve, Abraham; and Brown, Kenneth H., 3,856,744.

Continental Can Company, Inc.: *See—*
Moller, Jens L., 3,855,862.

Continental Copper & Steel Industries, Inc.: *See—*
Kalifon, Sam, 3,857,091.

Continental Oil Company: *See—*
Parsons, Roger C., 3,856,084.

Controls company of America: *See—*
Yatsushiro, Kenji; and Kuchuris, George F., 3,857,053.

Cook, Bernard D., to General Electric Company. Mounting apparatus for a surge voltage arrester. 3,856,242, Cl. 248-20.000.

Cooke, George A.; and Houlihan, William J., to Sandoz-Wander, Inc. Method of inhibiting inflammation using 1,4-disubstituted-methylenedioxy-2(1H)-quinazolinones and quinazolinthiones. 3,856,960, Cl. 424-251.000.

Cookson, Alan H.: *See—*
Sletten, Andreas M.; and Cookson, Alan H., 3,856,978.

Cooper, Duane H. Multidirectional sound reproduction. 3,856,992, Cl. 179-1.0gq.

Cooper, Hugh E.: *See—*
Helbing, Clarence R.; Peters, Russel; and Cooper, Hugh E., 3,855,764.

Cope, Geoffrey Wilton, to Dresser Industries, Inc. Coupler yoke with draft gear removal means. 3,856,153, Cl. 213-67.00a.

Corbett, John Frank; and Fooks, Allen G., to Gillette Company, The. Dyestuff and method of making and using same. 3,856,788, Cl. 260-244.00r.

Corte, Herbert; Heller, Harold; Lange, Michael; and Netz, Otto, to Bayer Aktiengesellschaft. Guanidine group containing anion exchange resins from amino group containing resins and cyanamides. 3,856,715, Cl. 260-21.00r.

Cota-Spedition International Container-Transporte GmbH & Co.: *See—*
Hartmann, Otto Ernst, 3,856,174.

Coulter Electronics, Inc.: *See—*
Duquesne, Victor, 3,856,071.

Courtright, Burr, to CH_2O, Inc. Agricultural wheel-lines. 3,856,039, Cl. 137-344.000.

Cox, Donald E., to PPG Industries, Inc. Potassium polyphosphate fertilizers containing micronutrients. 3,856,500, Cl. 71-34.000.

Cox, Edwin Dexter, to Johns-Manville Corporation. Drip irrigator device. 3,856,333, Cl. 285-14.000.

Cox, Wayne H., to Comfort Care Products. Clavicle brace. 3,856,004, Cl. 128-87.00r.

Cozzoli Machine Company: *See—*
McMickle, John F., Jr., 3,855,749.

CPC International, Inc.: *See—*
Daniher, Francis A.; and Zaslowsky, Joel A., 3,856,791.

Cracknell, Alan: *See—*
Duke, Dennis; Swain, Michael James; and Cracknell, Alan, 3,856,350.

Craftics, Inc.: *See—*
Greenwald, Harry, 3,856,458.

Cragg, William Donald; and Bradley, Stuart, to International Standard Electric Corporation. Pressure gradient piezoelectric microphone. 3,856,995, Cl. 179-121.00r.

Craig, Gale M., to General Motors Corporation. Leak detection system for sealed beam headlamp units. 3,855,844, Cl. 73-40.700.

Crapanzano, Angelo T.: *See—*
Steigerwald, John R.; Rasmussen, John P.; and Crapanzano, Angelo T., 3,856,365.

Crawford, Harry M., to Exxon Research and Engineering Company. Fluid impurity analyzer. 3,856,466, Cl. 23-230.00r.

Creusot-Loire: *See—*
Rinto, Georges, 3,855,940.

Creusot-Loire Enterprises: *See—*
Gay, Pierre, 3,855,888.

Crist, Edward C.: *See—*
Mack, Raymond E.; Patel, Kiritkumar R.; and Crist, Edward C., 3,856,124.

Crosby, Kenneth R. Ecology nail-clip reservoir device. 3,855,698, Cl. 30-124.000.

Crossman Arms Company, Inc.: *See—*
Hand, David R., 3,855,989.

Crowell, Millard D.: *See—*
Yagiela, Frank D.; and Crowell, Millard D., 3,855,843.

Crowley, Richard P.: *See—*
Sbarra, Anthony J., 3,856,628.

Crown Cork & Seal Company, Inc.: *See—*
Luviano, John J., 3,856,184.

Cryder, John R.; and Wirtz, Edward A., to Caterpillar Tractor Company. Combination relief and make-up valve. 3,856,041, Cl. 137-493.600.

CTS Chemicals & Technical Supplies Ltd.: *See—*
Hadomi, Menashe, 3,856,947.

Cuer, Jean-Pierre: *See—*
Texier, Nicole; Cuer, Jean-Pierre; and Gabriel, Michel, 3,856,917.

Cullis, Herbert M.; Fordham, Willard E.; and Soodak, Charles I., to Baxter Laboratories, Inc. Rotor apparatus. 3,856,470, Cl. 23-253.00r.

Cunningham, Hugh: *See—*
Raetzsch, Carl W.; and Cunningham, Hugh, 3,856,651.

Cuntze, Ulrich: *See—*
Diery, Helmut; and Cuntze, Ulrich, 3,856,893.

Currie Machinery Company: *See—*
Currie, Richard W., 3,856,158.

Currie, Richard W., to Currie Machinery Company. Means for palletizing open flapped cartons and the like in a pallet loading machine. 3,856,158, Cl. 214-6.0dk.

Curtiss-Wright Corporation: *See—*
Roberts, Thomas C., 3,855,972.

Curto, Paul A.: *See—*
Campagnuolo, Carl J.; and Curto, Paul A., 3,856,432.

Cushing, Vincent J. Self synchronous noise rejection circuit for fluid velocity meter. 3,855,858, Cl. 73-194.0em.

Cuttell, Willis Robert; and Truman, Norman Nathan, to International Computers Limited. Process for forming a manganese bismuthide film. 3,856,557, Cl. 117-71.00r.

Cutter Laboratories, Inc.: *See—*
Thompson, Charles R.; and Hidalgo, John, 3,856,963.

Cutts, Ronald George: *See—*
Wilson, John Stuart; and Cutts, Ronald George, 3,856,169.

Dahl, Carsten, to Patents and Developments A/S. Devices for tanks containing fluid medium. 3,856,078, Cl. 165-108.000.

Dahm, Johann; Borck, Joachim; Nowak, Herbert; Simane, Zdenek; and Kayser, Detlev, to Marck Patent Gesellschaft mit beschrankter Haftung. Pyrrole phenoxyacetic acid derivatives. 3,856,812, Cl. 260-326.410.

Dahm, Werner K.: *See—*
United States of America, National Aeronautics and Space Administration, 3,856,402.

Dai Nippon Toryo Co. Ltd.: *See—*
Furuya, Akio; and Ishimaru, Yukihiko, 3,856,885.

Daido Seiko Kabushiki Kaisha: *See—*
Asada, Chiaki; and Watanabe, Toshiyuki, 3,856,514.

Dailey, Benjamin P.: *See—*
Kincaid, John F.; Hammett, Louis P.; and Dailey, Benjamin P., 3,856,590.

Daimler-Benz Aktiengesellschaft: *See—*
Albrecht, Wilhelm; and Wulf, Helmut, 3,855,876.
Scholz, Hansjurgen; Brambilla, Luigi; and Allgaier, Rudolf, 3,856,103.

Daimon, Goro; Nakano, Seizo; and Kishi, Tuneo, to Hitachi, Ltd. Gas insulated switching apparatus. 3,857,006, Cl. 200-148.00f.

Daiwa Boseki Kabushiki Kaisha: *See—*
Yoshizawa, Toshio; Yamada, Yasuo; Taniguchi, Toshinori; Kose, Tatsuo; Ohchi, Kazuo; and Hori, Kiyokazu, 3,855,771.

Daley Inc.: *See—*
Daley, Robert S., 3,856,198.

Daley, Robert S., to Daley Inc. Interoffice envelope. 3,856,198, Cl. 229-71.000.

Damratowski, Leonard P., to Carrier Corporation. Apparatus for and a method of operating power recovery equipment. 3,855,788, Cl. 60-39.030.

Danckwerts, Peter V.: *See—*
Shrier, Adam L.; and Danckwerts, Peter V., 3,856,921.

Daniher, Francis A.; and Zaslowsky, Joel A., to CPC International, Inc. Preparation of amides. 3,856,791, Cl. 260-247.70h.

Danilewicz, John Christopher; Kemp, John Edward Glyn; Snarey, Michael; and Wright, James Robert, to Pfizer Inc. 1-Phenoxy-3-arylpiperazinyl-2-propanol hypotensives. 3,856,794, Cl. 260-268.0ph.

Dardick, David, to TRW Inc. Salvo ammunition for multiple bore open chamber gun. 3,855,931, Cl. 102-38.00s.

Dart Industries, Inc.: *See—*
Campagna, Edward R.; Hardy, Donald F.; Palmer, Thomas W., III; Daugherty, Barney R.; and Letawa, John R., 3,856,498.

Dasinger, Bruce L.: *See—*
Clamen, Allen; and Dasinger, Bruce L., 3,856,626.

Datatype Corporation: *See—*
Higginbotham, Roy F.; Melugin, Leland A.; and Hendrickson, Donald Carl, 3,857,020.

Dater, Arnold H.: *See—*
Mausner, Marvin L.; and Dater, Arnold H., 3,856,711.

Daugherty, Barney R.: *See—*
Campagna, Edward R.; Hardy, Donald F.; Palmer, Thomas W., III; Daugherty, Barney R.; and Letawa, John R., 3,856,498.

Dauksys, Richard J. Method for stabilizing polybenzimidazoles. 3,856,549, Cl. 117-33.300.

Daum, Werner; Scheinpflug, Hans; and Frohberger, Paul-Ernst, to Bayer Aktiengesellschaft. 2-Aminobenzimidazole-1-carboxylic acid ketone oxime esters. 3,856,811, Cl. 260-309.200.

Davidson, George R.; and Gustafson, David R., to Beloit Corporation. Papermaking machine headbox with slice chamber containing flexible trailing elements having extended edges. 3,856,619, Cl. 162-343.000.

Davidson, William A. Portable ball stop. 3,856,301, Cl. 273-55.00b.

Davis, Darryl B. Sugar cane wagon and the like. 3,856,354, Cl. 298-10.000.

Davis, Edward J.: *See—*
Lagrange, Don E.; Davis, Edward J.; Scheer, Eugene R.; Brewer, Ralph E.; and Hamilton, Curtis A., 3,857,042.

Davis, Hugh J. Method for mechanically applying an occlusion clip to an anatomical tubular structure. 3,856,016, Cl. 128-325.000.

Davis, James L., to Phillips Fibers Corporation. Two-for-one twister. 3,855,773, Cl. 57-58.830.

Davis, Mike, to Dresser Industries, Inc. Apparatus for utilizing compatible perforating fluid in well bores. 3,856,094, Cl. 175-4.520.

Davis, Moses P., Jr.: *See—*
Harrison, Henry F.; and Davis, Moses P., Jr., 3,856,706.

Davis, Richard C. Bullet resistant under garment. 3,855,632, Cl. 2-2.500.

Dawson, David H., to Dow Chemical Company, The. Oriented plastic tube. 3,856,905, Cl. 264-89.000.

Dayton Aircraft Products, Inc.: *See—*
Cline, Jay D.; and Grant, Don S., 3,857,066.
Farrell, Richard S.; and Ramos, Jose R., 3,855,917.

De Meester, Emiel Petrus Juliaan: *See—*
Jan Verstegen, Judicus Marinus Pieter; and De Meester, Emiel Petrus Juliaan, 3,856,697.

De Meux, Patrick Delaage; and Gourdon, Claude, to Societe Lignes Telegraphiques et Telephoniques. Automatic equalizing amplifiers for the transmission of digital signals. 3,857,048, Cl. 307-264.000.

De Penti, Kenneth L., to Midland-Ross Corporation. Railway car coupler. 3,856,154, Cl. 213-110.000.

Deane, Edward V.: *See—*
Deane, Loryn B.; and Deane, Edward V., 3,856,173.

Deane, Loryn B.; and Deane, Edward V. Trash receptacle. 3,856,173, Cl. 220-1.00t.

Debat, Jacques, to Laboratories du Dr. Debat. Prunus africana extract. 3,856,946, Cl. 424-195.000.

Debeau, Jean H.: *See—*
Minet, Roger P.; Debeau, Jean H.; and Thepault, Ernest L., 3,857,114.

Debrowski, Stanley F. Manually actuated ball mixing and dispensing device. 3,856,312, Cl. 273-144.00a.

Deering Milliken Research Corporation: *See—*
Bylund, Don M., 3,856,599.

Dehnert, Johannes: *See—*
Dunkelmann, Guenter; and Dehnert, Johannes, 3,856,772.

Delalio, George M. Synchronously shiftable dual range planetary transmission with coaxial input shafts. 3,855,879, Cl. 74-687.000.

Delamater, George B.; and Milligan, Barton, to Air Products and Chemicals, Inc. Purification of spent sulfuric acid. 3,856,673, Cl. 210-63.000.

Delgrego, Donald J.: *See—*
United States of America, National Aeronautics and Space Administration, 3,856,402.

Dengel, Jan Peter, to Amity Leather Products Company. Credit card billfold and multi-pocket liner therefor. 3,856,063, Cl. 150-35.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Mizunuma, Tsutomu; and Yoshida, Takeo, 3,856,540.

Denoux, Robert: *See—*
Billottet, Henri; Fechner, Patrice; Denoux, Robert; and Georgel, Jean, 3,855,899.

Denoyers, Jacques: *See—*

Lefrancois, Robert; Denoyers, Jacques; and Gabriel, Michel, 3,856,916.

Denzel, Theodor: *See—*
Hoehn, Hans; and Denzel, Theodor, 3,856,799.

Denzel, Theodor; and Hoehn, Hans, to Squibb, E. R., & Sons, Inc. 1-(2-Furanylmethyl)-1H-pyrazolo(3,4-b) pyridine-5-methanones. 3,855,675, Cl. 260-296.00h.

Derby, Richard: *See—*
O'Brien, Joseph L.; and Derby, Richard, 3,856,840.

Deschamps, Andre; and Faye, Georges, to Societe Lignes Telegraphiques et Telephoniques. Method of making a magnetic material part with spatial distribution of the permeability. 3,855,691, Cl. 29-608.000.

Deschenes, Pierre A.; Stephenne, Hubert; and Villeret, Michel, to Universite de sherbrooke. Syllabic adaptative delta modulation system. 3,857,111, Cl. 332-11.00d.

Deseret Pharmaceutical Company, Inc.: *See—*
Moorehead, Harvey Robert; and Reading, George R., 3,856,010.

DeSeversky, Alexander P., to Seversky Electronatom Corporation. High velocity wet electrostatic precipitator for removing gaseous and particulate contaminants. 3,856,476, Cl. 23-284.000.

Desitin-Werk Carl Klinke GmbH: *See—*
Brandau, Rainer, 3,856,964.

Desnick, Mandel L.: *See—*
Boler, Leonard J.; and Desnick, Mandel L., 3,856,280.

Deumens, Johannes J. M.; Verheijen, Egidius J. M.; and Thoma, Jozef A., to Stamicarbon B.V. V. Process for the preparation of coumarin and alkylated derivatives thereof. 3,856,819, Cl. 260-343.20r.

Deutsche Edelstahlwerke GmbH: *See—*
Brandis, Helmut; Oppenheim, Rudolf; Lennartz, Gustav; and Kiesheyer, Heinrich, 3,856,515.

Devenney, Robert F.: *See—*
Blackburn, Dale W.; Devenney, Robert F.; and Mlynarski, John J., 3,856,704.

Dexter, Martin; and Knell, Martin, to Ciba-Geigy Corporation. Compositions stabilized with hydroxyphenyl acylamides. 3,856,748, Cl. 260-45.9nc.

Deyak, Frank L., to Minnesota Mining & Manufacturing Company. Color projection transparencies. 3,856,552, Cl. 117-36.200.

Diamond Shamrock Corporation: *See—*
La Fortune, Robert, 3,856,482.
Lieb, Donald F.; and Stillman, Neil W., 3,856,642.

Diassi, Patrick A.: *See—*
Stiller, Eric T.; Levine, Seymour D.; Principe, Pacifico A.; and Diassi, Patrick A., 3,856,977.

Dibiasi, D. J., to Mobil Oil Corporation. Programmed degradation of polyolefins. 3,856,747, Cl. 260-45.70p.

Dickey-john Corporation: *See—*
Fathauer, George H.; and Bachman, Wesley J., 3,855,953.

Dickie, Ray A.; and Newman, Seymour, to Ford Motor Company. Graded rubber particles having hydroxy functionality and a polymeric crosslinking agent. 3,856,883, Cl. 260-836.000.

Dickson, Thomas K., to Hercules Incorporated. Use of certain N-(2,6-dihalobenzylidene)-benzylamines and certain N-(2,6-dihalobenzylidene) phenylethylamines. 3,856,504, Cl. 71-121.000.

Diehl, Karl-Heinz: *See—*
Eggensperger, Heinz; Franzen, Volker; Diehl, Karl-Heinz; and Kloss, Wilfred, 3,856,846.

Diery, Helmut; and Cuntze, Ulrich, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Hybrid ionic phosphorus compounds. 3,856,893, Cl. 260-924.000.

Dieter, Jerry A.; Russell, Donald H.; and Sauer, Richard W., to Atlantic Richfield Company. Cyclic nitrile adduct-epoxide compositions. 3,856,720, Cl. 260-2.50a.

Dietrich, Charles. Air filter and air filtering system. 3,856,491, Cl. 55-478.000.

Dighe, Shrikant V.; and Bush, Richard W., to Grace, W. R., & Co. Sulfonamides related to N,N,N',N'-tetrallyl-diphenylether-4,4'-disulfonamide. 3,856,858, Cl. 260-556.0ar.

Dikoff, Joseph K. Signature writer. 3,855,926, Cl. 101-336.000.

Dilello, Carmen J.; and Hart, David K., to Cir-Cut Corporation. Cutting rule. 3,855,892, Cl. 83-835.000.

Dillon, Glenn W., to Thermo Electron Corporation. Apparatus for measuring nox concentrations. 3,856,473, Cl. 23-254.00e.

Dillon, Michael L.: *See—*
Chung, Tae H.; Dillon, Michael L.; and Lines, Gregory L., 3,856,862.

Dinning, Robert W., to Macco Oil Tool Company, Inc. Selective positioning well tool apparatus. 3,856,082, Cl. 166-154.000.

Distugil S.A.: *See—*
Walker, David John; and Branlard, Paul (said Branlard, Paul, assor. to), 3,856,730.

Dittrich, Volker: *See—*
Nikles, Erwin; Dittrich, Volker; and Pinter, Ladislaus, 3,856,816.
Nikles, Erwin; Dittrich, Volker; and Pinter, Ladislaus, 3,856,968.

Diveley, William Russell, to Hercules Incorporated. Separation of amorphous sulfur and 0,0-di(c1-c8 alkyl) phosphoro-chloridothioate. 3,856,898, Cl. 260-990.000.

Dobinson, Bryan; and Winterbottom, Kenneth, to Ciba-Geigy AG. Method of modifying keratinous textiles and fibres and products obtained. 3,856,464, Cl. 8-127.500.

Dobrovolsky, Evgeny Vladimirovich: *See—*
Grechanichenko, Grigory Mikhailovich; Gusinsky, Evgeny Savelievich; Petrukhno, Anatoly Semenovich; and Dobrovolsky, Evgeny Vladimirovich, 3,856,481.

Doe, Ewart H.; and Linforth, William J., to Twyford Moors (Aircraft & Engineering) Limited. Guide rollers. 3,856,197, Cl. 226-181.000.

Doherty, Daniel Anthony: *See—*
Jenkins, Victor Frederick; and Doherty, Daniel Anthony, 3,856,716.

Doherty, John, Jr., to Texas Instruments Incorporated. Thermally responsive valve assembly. 3,856,259, Cl. 251-11.000.

Dominion Auto Accessories Limited: *See—*
Brudy, Peter E., 3,855,670.

Domtar Limited: *See—*
Kirkham, William Brian, 3,856,564.

Donahue, Edward T.: *See—*
Kenney, Harold E.; and Donahue, Edward T., 3,856,688.

Doolittle, Donald B., to All American Industries, Inc. Composite aircraft. 3,856,236, Cl. 244-2.000.

Dornier Systems GmbH: *See—*
Wohnhaas, Horst; Haas, Kurt; and Granzow, Manfred, 3,856,367.

Dorph, Thor. Automatic line release for spin fishing equipment. 3,855,720, Cl. 43-25.000.

Dorsch, Dieter: *See—*
Dosch, Peter; and Dorsch, Dieter, 3,857,098.

Doryokuro Kakunenryo Kaihatsu Jigyodan: *See—*
Tomabechi, Ken, 3,856,620.

Dosch, Peter; and Dorsch, Dieter, to Heberlein & Co., AG. Process for measuring the revolution speed of a false twist tube. 3,857,098, Cl. 324-174.000.

Douglas, Joseph, to Rolls-Royce (1971) Limited. Radiation pyrometers. 3,855,864, Cl. 73-355.00r.

Dow Chemical Company, The: *See—*
Ayres, Ralph E., 3,856,904.
Caldecourt, Victor J., 3,857,094.
Dawson, David H., 3,856,905.
Jankowiak, Erwin M.; Niles, Earl Thomas; and Lane, George A., 3,856,933.
Martin, Robert C., 3,856,541.
Nelson, David A., 3,856,739.
Noveroske, Robert L., 3,856,502.
Walles, Wilhelm E., 3,856,172.
West, Charles M.; Graham, Glen H.; and Kennedy, James S., 3,856,891.

Dow Corning Corporation: *See—*
Harper, Jack R., 3,856,908.
Householder, Kermit W., 3,856,701.

Dow Corning Limited: *See—*
Chandra, Grish, 3,856,837.

Dowd, Daniel J., Jr., to Westvaco Corporation. Method and apparatus for coreless spool production. 3,856,226, Cl. 242-56.00r.

Dowidchuk, George; and Stockman, James R., to Oglebay Norton Company. X-shaped hot top corner wedge. 3,856,258, Cl. 249-197.000.

Dozier, Ross T.: *See—*
Joyce, Ronald W.; and Dozier, Ross T., 3,855,990.

Dreher, James Howard, to McCord Corporation. Resilient energy absorbing assembly. 3,856,615, Cl. 161-168.000.

Dresser Industries, Inc.: *See—*
Cope, Geoffrey Wilton, 3,856,153.
Davis, Mike, 3,856,094.
Dyer, Norman Dean, 3,856,091.

Drew Engineering Co.: *See—*
Portouw, Robert C., 3,855,713.

Drews, Reinhold Alvin; Rosinski, Alexander B., Jr.; and Gauer, Joseph August, to Whirlpool Corporation. Siphon break and diverter for an appliance. 3,856,036, Cl. 137-216.100.

Driver, Michael C.: *See—*
Kim, He B.; and Driver, Michael C., 3,855,690.

Droppleman, David A.: *See—*
Alphin, Reevis S.; and Droppleman, David A., 3,856,962.

Drumm, Arthur E. Brush section. 3,855,660, Cl. 15-181.000.

D.T. & N. Keighley (Whalley) Limited: *See—*
Keighley, Neville, 3,856,247.

Du Pont de Nemours, E. I., and Company: *See—*
Angerman, Albert Henry; and Moore, Carl Gordon, 3,856,929.
Hoeschele, Guenther Kurt, 3,856,749.
Johnson, Donald R.; and Sawers, James R., Jr., 3,856,480.
Pedersen, Charles J., 3,856,813.
Wray, Rhodes Ebeling, 3,856,225.

Dudley, Kenneth W.: *See—*
MacMaster, George H.; and Dudley, Kenneth W., 3,857,009.

Duffy, Donald R.: *See—*
Mulich, Stephen F.; Duffy, Donald R.; and Salter, Steven J., 3,855,930.

Dugan, William P., to General Dynamics Corporation. Method of manufacturing circuit board connectors. 3,855,692, Cl. 29-625.000.

Duke, Dennis; Swain, Michael James; and Cracknell, Alan, to Arenson, A., Limited. Chairs. 3,856,350, Cl. 297-355.000.

DuLaney, Lucius B.; and Theobold, Erwin F., to Kaolin Corporation. Method of producing kaolin clay from ore having silica sand content. 3,856,213, Cl. 241-4.000.

Dulle, Bernard A., to Procter & Gamble Company, The. Hollow foam tampons from flat blanks. 3,856,013, Cl. 128-285.000.

Duncan, Douglas W.: *See—*

McElroy, Roderick O.; and Duncan, Douglas W., 3,856,913.

Dunham, Gerald Pitman, to American Standard Inc. Striker mechanism for plumbing fixtures. 3,855,648, Cl. 4-199.000.

Dunham-Bush, Inc.: *See—*
Bulkley, Clifford T., 3,856,493.

Dunkelmann, Guenter; and Dehnert, Johannes, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Azo dyes of the diamino pyrimidine series. 3,856,772, Cl. 260-154.000.

Dunlap, Donald E.: *See—*
Durkee, Jackson L.; Beighley, Arthur F.; and Dunlap, Donald E., 3,855,777.

Dunlap, Mary E.: *See—*
Durkee, Jackson L.; Beighley, Arthur F.; and Dunlap, Donald E., 3,855,777.

Dunlop, William R., to Richardson Company, The. Molded rubber products and related compositions. 3,856,175, Cl. 220-22.000.

Dunn, Kathy A.: *See—*
Breslow, Jeffrey D.; and Dunn, Kathy A., 3,856,308.

Dunton, Roy P.: *See—*
Seifert, Lester H.; Powers, Raymond P.; Schmidt, William M.; Thorwaldsen, Stanley E.; Smith, Frederick W.; McElroy, David C.; and Dunton, Roy P., 3,855,763.

Duquesne, Victor, to Coulter Electronics, Inc. Device for detaching tire beads from a wheel rim. 3,856,071, Cl. 157-1.260.

Durkee, Jackson L.; Beighley, Arthur F.; and Dunlap, Donald E.; deceased (by Dunlap, Mary E.; administratrix), to Bethlehem Steel Corporation. Reel of alternately rotated parallel-wire strand and method of making. 3,855,777, Cl. 57-156.000.

Dusza, John Paul; Lindsay, Harry Lee; and Bernstein, Seymour, to American Cyanamid Company. Beta-naphthyl alkylidene carbazic acid esters. 3,856,838, Cl. 260-471.00c.

Dyachkov, Vladimir Konstantinovich. Endless belt conveyor. 3,856,133, Cl. 198-182.000.

Dyckerhoff & Widmann Aktiengesellschaft: *See—*
Herbst, Thomas; and Finsterwalder, Klemens, 3,855,804.

Dydzyk, Michael. Apparatus for making and storing hot asphalt paving material. 3,856,275, Cl. 259-161.000.

Dyer, Curtis A.: *See—*
Tornoe, John A.; and Dyer, Curtis A., 3,856,339.

Dyer, Norman Dean, to Dresser Industries, Inc. Adjustable drill support. 3,856,091, Cl. 173-39.000.

Dynarad, Inc.: *See—*
Whittier, Carl H., 3,857,017.

Earle, Henry: *See—*
Fothergill, Bernard Henry; Earle, Henry; and Kelly, William John, 3,856,269.

Eastman Kodak Company: *See—*
Beach, David Easton, 3,856,456.
Bissonette, Vernon Leon, 3,856,524.
Bundschuh, John J.; Roman, Robert J.; and Burndshuh, John J., 3,856,234.
Grisdale, Patrick J.; and Babb, Bruce E., 3,856,531.
Hamb, Fredrick L.; Hiller, Gary L.; and Wise, Albert W., 3,856,526.
Hamb, Fredrick L.; Hiller, Gary L.; and Wise, Albert W., 3,856,527.
McConnell, Richard L., 3,856,889.
Wilson, John C., 3,856,751.

Eaton Corporation: *See—*
Bojas, Edward J.; and Ward, Harold R., 3,855,792.
Kenny, Andrew Augustine; Larson, Richard Kendall; and Janous, Donald Frank, 3,856,045.
Leichliter, Wayne K., 3,856,122.
Mack, Raymond E.; Patel, Kiritkumar R.; and Crist, Edward C., 3,856,124.

Ecology Board, Inc.: *See—*
Chand, Ramesh, 3,856,204.

Edgar, James S. Method for forming threads on plastic nipples. 3,856,906, Cl. 264-138.000.

Edmonds, James T., Jr.: *See—*
Tieszen, Dale O.; and Edmonds, James T., Jr., 3,856,736.

Eggensperger, Heinz; Franzen, Volker; Diehl, Karl-Heinz; and Kloss, Wilfred, to Ciba-Geigy Marienberg GmbH. Process for preparing bis-(4-hydroxy-3,5-dialkyl-benzyl) carboxylic acid esters. 3,856,846, Cl. 260-465.00d.

Ehrhardt, Orville W.: *See—*
Seichter, Daniel J.; and Ehrhardt, Orville W., 3,857,051.

Eiseman, Fred S., Jr.; Schenck, Leslie M.; and Beiswanger, John P. G. Phosphonamides. 3,856,895, Cl. 260-945.000.

Eisenmann, Gerhard, to Werner & Pfleiderer. Twin-screw extruder with adjustable throttling means. 3,856,278, Cl. 259-192.000.

Eisenwerke-Gesellschaft Maximilianshutte m.b.H.: *See—*
Nilles, Paul Emile, 3,856,510.

Eklund, Kurt I.: *See—*
Sebilleau, Roger V.; and Eklund, Kurt I., 3,855,945.

Elder, Keith Robert McMillan: *See—*
Puckowski, Robert Tadeusz; Hagger, John Michael Richards; and Elder, Keith Robert McMillan, 3,856,980.

Eleanor D. J.: *See—*
Pickard, Frank W., 3,855,825.

Electric Hose & Rubber Company: *See—*
Schultz, John J., 3,856,446.

Ellestad, George Alfred; Martin, John Henry Edward James; and Porter, John Norman, to American Cyanamid Company. Antibiotic BL869 beta and method of preparation. 3,856,939, Cl. 424-116.000.

Ellis, Howard F.: *See—*
Pitha, John J.; and Ellis, Howard F., 3,856,567.

Ellis, Jonas: *See—*
Merlino, Eugene L., Jr.; Naeyaert, Roger S., Jr.; and Ellis, Jonas, 3,856,984.

Elm, Karl Horst; Schatton, Paul; and Kruse, Joachim, to Mannesmann Aktiengesellschaft. Pipe coupling. 3,856,337, Cl. 285-334.000.

Elmore, Jeffrey T., to Mobil Oil Corporation. Automatic screen changer for extruding processes. 3,856,680, Cl. 210-184.000.

Emigh, Stuart G.: *See—*
Noble, Jack E.; Riggle, Peter; Emigh, Stuart G.; and Martini, William R., 3,855,795.

Endo, Hiroyasu: *See—*
Iwata, Tokushige; Sakamoto, Kiyoaki; Nawata, Teruo; Endo, Hiroyasu; Nakano, Masaru; and Murayama, Hajime, 3,856,478.

Engelhard Minerals & Chemicals Corporation: *See—*
Zentz, William E., Jr., 3,856,563.

English, Myrle H.; Goodstal, Laurence; Leek, Wayne E.; Sanzo, Robert J.; Turner, Robert L.; Workman, Clark B.; and Yetter, Edward W., to Remington Arms Company, Inc. Numerically controlled engraving machine system. 3,857,025, Cl. 235-151.110.

English, Ray H., to Blaw-Knox Company. Low creep high strength ferrous alloy. 3,856,516, Cl. 75-128.00w.

Engvall, Erik Arne; and Ritscher, Thomas, to Keijser, Carl, & Co., AB. Framework construction. 3,856,113, Cl. 182-194.000.

Epis, James J., to GTE Sylvania Incorporated. Broadband quarter-wave plate assembly. 3,857,112, Cl. 333-21.00a.

Erb, Edward R., to GAF Corporation. Production of spherical polyvinyl chloride particles. 3,856,900, Cl. 264-9.000.

Eriksson, Bolik Anders; and Vukotic, Milos, to Aktiebolaget Electrolux. Vacuum cleaner. 3,855,666, Cl. 15-372.000.

Eriksson, Erik Lennart: *See—*
Hill, Jan Erik; Eriksson, Erik Lennart; and Lennartsson, Mats, 3,856,408.

Esemplare, Pascal E.; and Beeferman, Dennis, to Sutures, Inc. Rubber articles having improved slip coating. 3,856,561, Cl. 117-139.000.

Eskesen, John H.: *See—*
Grondahl, Clayton M.; and Eskesen, John H., 3,856,433.

Essex International, Inc.: *See—*
Arick, Robert E.; and Vogel, Ralph A., 3,856,221.

Esso Production Research Company: *See—*
Peters, Beldon A.; Smith, Louis P.; and Landrum, Aubrey O., 3,856,677.

Esso Research and Engineering Company: *See—*
Maravetz, Lester L., 3,856,860.

ETA A.G. Ebauches-Fabrik: *See—*
Giger, Urs; and Perrot, Friedrich, 3,855,779.

Etablissement Wanderfield & Co.: *See—*
Filter, Walther, 3,856,056.

Etablissements Carpano & Pons: *See—*
Sentou, Bernard, 3,856,317.

Ethyl Corporation: *See—*
Becker, Warren E.; Johnston, James D.; and Hildreth, Clarence L., 3,856,511.
Keblys, Kestutis A., 3,856,832.
Sanders, Robert N.; and Valdo, Alex R., 3,856,583.
Wikman, Andrew O., 3,856,844.

Etoo, Yukihiro: *See—*
Masaki, Kenji; and Etoo, Yukihiro, 3,855,975.

Ettinger, Donald N., to Hit-Away, Inc. Protective neck collar. 3,855,631, Cl. 2-2.000.

Etzbach, Volker: *See—*
Simon, Johannes; Etzbach, Volker; Grimm, Peter; and Ford, Wolfgang, 3,855,810.

Eubank, Marcus P. Mobile home adapted for externally mounted air conditioning unit and unit therefor. 3,855,814, Cl. 62-244.000.

Evans, Jesse L.; and Hecker, Eugene L., to General Motors Corporation. Ventilated windowed oven door. 3,855,994, Cl. 126-198.000.

Evans, Robert B. Multiposition holder for sheet metal edger. 3,855,834, Cl. 72-179.000.

Eversole, William C., to United States of America, Navy. Tool support. 3,856,428, Cl. 408-240.000.

EVO Corporation: *See—*
Vokral, Edward J., 3,856,489.

Explo-Ridgeway International Limited: *See—*
Ridgeway, John J., 3,855,929.

Exxon Research & Engineering Co.: *See—*
Thaler, Warren A.; Buckley, Donald J., Sr.; and Kennedy, Joseph P., 3,856,763.

Exxon Research and Engineering Company: *See—*
Chappell, Gilford A., 3,856,663.
Clamen, Allen; and Dasinger, Bruce L., 3,856,626.
Crawford, Harry M., 3,856,466.
Shrier, Adam L.; and Danckwerts, Peter V., 3,856,921.

F & O Research and Development Company: *See—*
Forkner, Claude E.; and O'Rork, Charles T., Jr., 3,855,765.

Fackler, George E., to General Electric Company. Liquid dispenser having improved overfill protector. 3,856,058, Cl. 141-18.000.

Fahey, Darryl R., to Phillips Petroleum Company. Synthesis of 5-vinylcyclohexa-1,3-diene. 3,856,868, Cl. 260-666.00a.

Fahlstrom, Per Anders Herman Henningsson; and Gorling, Karl Goran, to Boliden Aktiebolag. Method of roasting fine granular sulphide material in fluidized bed furnaces. 3,856,506, Cl. 75-3.000.

Fairchild Hiller Corporation: *See—*
Torian, John T.; and Safford, Richard W., 3,856,237.

Falk, Morris, to Fort Lock Corporation. Key retaining lock. 3,855,824, Cl. 70-38.00a.

Faltot, Maurice J.; and Voltmer, Helmut, to NJM, Inc. Apparatus for automatically registering and combining two sheet members. 3,856,607, Cl. 156-351.000.

Fan, Hsing Y., to Shell Oil Company. Phosphoramidothioates. 3,856,897, Cl. 260-959.000.

Fan, You Ling; and Greggshaw, Richard, to Union Carbide Corporation. Coupling solid substrates using silyl peroxide compounds. 3,856,606, Cl. 156-329.000.

Farber, Gerald: *See—*
Steinberg, Meyer; Colombo, Peter; and Farber, Gerald, 3,856,054.

Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See—*
Diery, Helmut; and Cuntze, Ulrich, 3,856,893.
Hoyer, Ernst; and Schladetsch, Hans Jakob, 3,856,773.

Farmer, Marion R., to Aluma-Form, Inc. Interengaged component electrical equipment mount. 3,856,250, Cl. 248-221.000.

Farrell, Richard S.; and Ramos, Jose R., to Dayton Aircraft Products, Inc. Truss plate press. 3,855,917, Cl. 100-35.000.

Fathauer, George H.; and Bachman, Wesley J., to Dickey-john Corporation. Controlled population planter system. 3,855,953, Cl. 111-1.000.

Fattor, Arthur P. Form for wall panels with imbedded heating tubes. 3,856,254, Cl. 249-39.000.

Faulkner, Robert W. Rope drops. 3,856,340, Cl. 294-19.00r.

Favreau, Michel; and Vidal, Serge, to Thomson-CSF. Continuous film drive for a telecine equipment. 3,856,990, Cl. 178-7.200.

Faye, Georges: *See—*
Deschamps, Andre; and Faye, Georges, 3,855,691.

Fechner, Patrice: *See—*
Billottet, Henri; Fechner, Patrice; Denoux, Robert; and Georgel, Jean, 3,855,899.

Feierabend, Georg, to Rotel AG. Centrifugal juice extractor. 3,855,911, Cl. 99-511.000.

Fejer, Mark E.: *See—*
Nesbitt, John D.; Larson, Dennis H.; and Fejer, Mark E., 3,856,496.

Ferguson, Christopher A., to ICI American Inc. Emulsifiable haloalkyl phosphate blend for aqueous textile flame-retardant treatments. 3,856,535, Cl. 106-15.0fp.

Ferrario, Bruno: *See—*
Porta, Paolo Della; Cataluppi, Angelo; Ferrario, Bruno; and Montalenti, Paolo, 3,856,709.

Ferrigno, Thomas Howard. Pigmentary composition. 3,856,545, Cl. 106-288.00b.

Feucht, Robert H., to Goodyear Tire and Rubber Company, The. Hose structure. 3,856,052, Cl. 138-119.000.

Feuz, Fritz, to Von Roll AG. Werk Bern. Brake system for a travelling brake carriage of an aerial cableway. 3,856,118, Cl. 188-42.000.

Fibco Incorporated: *See—*
Fitch, John C., 3,856,268.

Field, Eugene P.; and Bergstedt, Donald C., to FNB Products, Inc. Pressure responsive fluid valve assembly. 3,856,043, Cl. 137-508.000.

Field Manufacturing Co., Inc.: *See—*
Helfgott, Saul, 3,856,309.

Fields, Fred W., to Coe Manufacturing Company, The. Veneer article and process of manufacturing plywood. 3,856,600, Cl. 156-93.000.

Filliung, Jacques J.; Nelson, Axel B.; and Billeter, Henry R., to Sloan Valve Company. Bedpan rinser apparatus. 3,855,640, Cl. 4-7.000.

Filter, Walther, to Vereinigte Osterreichische Eisen- und Stahlwerke Alpine Montan Aktiengesellschaft and Etablissement Wanderfield & Co. Battening apparatus in flat weaving machine. 3,856,056, Cl. 139-291.00r.

Fingerhut Corporation: *See—*
Stangel, Frank J., 3,856,115.

Finical, Thomas N., Jr.: *See—*
Smith, Calvin S., Jr., 3,856,631.

Finkenzeller, Johann: *See—*
Franke, Kurt; and Finkenzeller, Johann, 3,857,039.

Finsterwalder, Klemens: *See—*
Herbst, Thomas; and Finsterwalder, Klemens, 3,855,804.

Firestone Tire & Rubber Company The: *See—*
Fritschel, Larry Edwin, 3,856,721.
Halasa, Adel F.; and Cheng, Tai Chun, 3,856,768.

Fischer, Charles F., to Colgate-Palmolive Company. Means for high speed trimming of soap extrusions. 3,856,449, Cl. 425-308.000.

Fischer, Edgar: *See—*
Vogt, Wilhelm; Fischer, Edgar; and Auer, Eberhard, 3,856,755.

Fischer, Henry V. Diving board construction. 3,856,296, Cl. 272-66.000.

Fishback, James K.: *See—*
Hughes, Carroll T., Jr.; and Fishback, James K., 3,855,950.

Fisher, Edward; Rautio, Wilbur S.; Jankowiak, Roman; and Natell, Richard W., to Conax Corporation. Electrical penetrant structure. 3,856,983, Cl. 174-151.000.

Fitch, John C., to Fibco Incorporated. Highway safety device. 3,856,268, Cl. 256-13.100.

Fitts, Jane W. Yarn palette. 3,856,140, Cl. 206-388.000.

Flamand, Guy; and Lazzarini, Henri, to Saint-Gobain Industries. Loading and conveying apparatus. 3,856,131, Cl. 198-26.000.

Flanagan, Paul Frederick: *See—*
Marsden, Frank Charles; Maden, John; and Flanagan, Paul Frederick, 3,856,834.

Flannelly, William G., to Kaman Aerospace Corporation. Vibration isolator. 3,856,267, Cl. 254-183.000.

Flat-Back Corporation: *See—*
Light, Richard U., 3,856,349.

Fleischmann, Martin; King, Christopher John Hall; Oldfield, John Wilfred; Plimley, Raymond Ernest; and Tennakoon, Charles Lionel Kasturiratne, to National Research Development Corporation. Electrochemical cells. 3,856,652, Cl. 204-268.000.

Fleming, Robert W.; and Sill, Arthur D., to Richardson-Merrell Inc. Bis-basic ketones of thioxanthene. 3,856,789, Cl. 260-246.00b.

Fleshman, Shirley: *See—*
Clark, Glenn W.; and Richardson, Oliver F., 3,857,015.

Fletcher, Kenneth S., III, to Foxboro Company, The. Concentration measurements utilizing coulometric generation of reagents. 3,856,633, Cl. 204-1.00t.

Fletcher, Martin J.: *See—*
Nodine, John H.; Waite, John Herbert; Waite, Herbert; and Fletcher, Martin J., 3,856,930.

Florek, Florian F. Hay hook and twine cutter. 3,856,341, Cl. 294-24.000.

Fluid Energy Processing & Equipment Company: *See—*
Van Vliet, Edward, 3,856,215.

Flye, Donald R.: *See—*
Neunherz, Herbert W.; Bryant, Robert G.; and Flye, Donald R., 3,855,650.

FMC Corporation: *See—*
Garrett, Michael R.; Putch, Samuel W.; and Nelson, Norman A., 3,856,037.
Hemker, Herman W., 3,856,270.

FNB Products, Inc.: *See—*
Field, Eugene P.; and Bergstedt, Donald C., 3,856,043.

Foellner, Donald M. Illuminated time piece. 3,855,784, Cl. 58-50.00r.

Foley, John J. Print control system for high speed printers. 3,855,923, Cl. 101-93.290.

Fontana, C. Michael; and Sparks, Byran. Method of copolymerizing unhindered conjugated dienes with maleic anhydrides. 3,856,760, Cl. 260-78.5bb.

Fooks, Allen G.: *See—*
Corbett, John Frank; and Fooks, Allen G., 3,856,788.

Forbis, John Conrad, to Boeing Company, The. Parachute suspension lines. 3,856,240, Cl. 244-142.000.

Ford, Francis L. Window screen cleaning apparatus. 3,855,658, Cl. 15-77.000.

Ford Motor Company: *See—*
Allison, William D., 3,856,101.
Arning, Klaus H.; and Rumpf, Robert J., 3,856,323.
Beck, Robert H.; and Rusch, Kenneth C., 3,856,424.
Dickie, Ray A.; and Newman, Seymour, 3,856,883.
Jones, David C., 3,857,087.
Loon, Fred G., 3,855,981.
Mooney, Robert A.; and Bell, John M., 3,857,086.
Philipp, Erich, 3,855,683.
Philipp, Erich, 3,855,837.
Schmatz, Duane J., 3,855,679.
Simko, Aladar O., 3,856,438.

Ford, Wolfgang: *See—*
Simon, Johannes; Etzbach, Volker; Grimm, Peter; and Ford, Wolfgang, 3,855,810.

Fordham, Willard E.: *See—*
Cullis, Herbert M.; Fordham, Willard E.; and Soodak, Charles I., 3,856,470.

Forget, Ronald D.; and Saravis, Calvin A., to Marine Colloids, Inc. Sample applicator. 3,855,846, Cl. 73-61.10c.

Forkner, Claude E.; and O'Rork, Charles T., Jr., to F & O Research and Development Company. Ladderless, continuously usable, rapid fruit picker and conveyor. 3,855,765, Cl. 56-340.000.

Formflo Limited: *See—*
Connell, Gordon Sidney, 3,855,833.

Forsyth, James M., to General Metalcraft, Inc. Knock-down desk construction. 3,856,371, Cl. 312-195.000.

Fort Lock Corporation: *See—*
Falk, Morris, 3,855,824.

Fortin, Raymond, to Regie Nationale des Usines Renault, et Automobiles Peugeot. Wiper device for vehicle lighting systems. 3,855,662, Cl. 15-250.010.

Foster, Burnham; and Schneider, Morton. Security box. 3,855,949, Cl. 109-23.000.

Foster, George W.; and Campbell, Alexander J., to Koehler-Dayton, Inc. Recirculating sewerage system. 3,855,641, Cl. 4-10.000.

Foster, Howard F. Tensioning device. 3,856,265, Cl. 254-161.000.

Foster, John; and Henry, Ernest, to Amalgamated Dental Company, Limited, The. Surgical cements of improved compressive strength containing stannous flouride and polyacrylic acid. 3,856,737, Cl. 260-29.60m.

Fothergill, Bernard Henry; Earle, Henry; and Kelly, William John, to Albright & Wilson Limited. Mixing apparatus. 3,856,269, Cl. 259-4.000.

Fournier, Roger H., to Swasey, Warner R., Company, The. Grinding machine with workpiece locator assembly. 3,855,734, Cl. 51-165.00r.

Fowler, Susan M.; Gottfried, Carolyn Jobst; Mosiniak, Dennis G.; and Tenteris, Ansis U., to Jobst Institute, Inc. Elastic garment for imposing pressure on underlying body regions. 3,856,008, Cl. 128-165.000.

Fox, James D.; Norman, Earl P., Jr.; and Sansbury, Jerry F., to Sonoco Products Company. Container end with protective bead. 3,856,179, Cl. 220-270.000.

Foxboro Company, The: *See*—
Fletcher, Kenneth S., III, 3,856,633.

Foxton, Sidney Brian, to Arundel Corporation, The. Method of producing lightweight expanded slag. 3,856,495, Cl. 65-19.000.

Francis, Ajax C., Jr., to Western Electric Company, Incorporated. One-quarter turn fastener. 3,855,895, Cl. 85-1.001.

Frank, Alan I. W., The, Corporation: *See*—
Schaeffer, Paul R., 3,856,903.

Frank, Robert G., to PPG Industries, Inc. Shaping heat-softened glass sheets by roll forming. 3,856,499, Cl. 65-104.000.

Franke, Kurt; and Finkenzeller, Johann, to Siemens Aktiengesellschaft. X-ray device. 3,857,039, Cl. 250-402.000.

Frantti, Paul R. Hockey practice apparatus. 3,856,298, Cl. 273-1.00b.

Franzen, Volker: *See*—
Eggensperger, Heinz; Franzen, Volker; Diehl, Karl-Heinz; and Kloss, Wilfred, 3,856,846.

Frazer, David S.: *See*—
Parrett, John T.; and Frazer, David S., 3,856,152.

Freed, Meier E.; and Archibald, John L., to American Home Products Corporation. Cyclic amides of 1,4-diaminobut-2-yne. 3,856,790, Cl. 260-247.20a.

Freedman, Elaine: *See*—
Glickman, Sophie, 3,855,646.

Freitag, Herbert, to Stabilus GmbH. Piston rod seal for adjustable pneumatic spring. 3,856,287, Cl. 267-64.00r.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Peter, Klaus-Dieter, 3,856,632.

Friedheim, Ernst A. H. Method of combating filariasis in dogs. 3,856,971, Cl. 424-297.000.

Fries, Ake: *See*—
Suvanto, Antti; and Fries, Ake, 3,856,621.

Frisque, Alvin J., to Nalco Chemical Company. Method of extinguishing oil and gas well fires. 3,856,088, Cl. 169-46.000.

Fritschel, Larry Edwin, to Firestone Tire & Rubber Company The. Syntactic foams and their preparation. 3,856,721, Cl. 260-2.50b.

Frohberger, Paul-Ernst: *See*—
Daum, Werner; Scheinpflug, Hans; and Frohberger, Paul-Ernst, 3,856,811.

Fromme, Hans-Georg; and Lehberger, Erich, to Aufzuge, R. Stahl, GmbH. Mono-rail trolley. 3,855,941, Cl. 105-150.000.

Frye, Bruce J. Self-securing holding device. 3,856,249, Cl. 248-205.00a.

Fuchs, Hugo: *See*—
Kartte, Klaus; Fuchs, Hugo; Jockers, Kurt; Kahr, Kurt; and Meier, Hermann, 3,856,924.

Fuchs, Peter; and Schopflin, Gisela, to Schering Aktiengesellschaft. Medicated stick. 3,856,931, Cl. 424-14.000.

Fudge, William L., to Larsen's Manufacturing Company. Fire extinguisher cabinet. 3,856,177, Cl. 220-82.00r.

Fuhr, Karl: *See*—
Traenckner, Hans-Joachim; Rudolph, Hans; Rosenkranz, Hans Jurgen; Fuhr, Karl; and Patheiger, Manfred, 3,856,644.

Fuji Oil Company, Ltd.: *See*—
Tateishi, Teizabro; Murase, Koichi; and Iwanaga, Yukio, 3,856,831.

Fuji Photo Film Co., Ltd.: *See*—
Hayashi, Takao; Matsukawa, Hiroharu; and Kiritani, Masataka, 3,856,553.
Miyano, Shizuo; and Kondo, Asaji, 3,856,699.
Satomura, Masato, 3,856,757.

Fujii, Yoshihisa: *See*—
Honma, Seishi; and Fujii, Yoshihisa, 3,855,874.

Fujimori, Motoyuki: *See*—
Oki, Toshihiko; Kurita, Hirohisa; and Fujimori, Motoyuki, 3,856,577.

Fujimoto, Keimei; Hirano, Masachika; Takeda, Hisami; and Ooba, Shigehiro. Carbamate pesticides. 3,856,972, Cl. 424-298.000.

Fujioka, Yoshisato, to Kabushiki Kaisha Yashica. Extrawide-angle retrofocus type of objective. 3,856,386, Cl. 350-214.000.

Fujisaki, Yoshinori, to Yoshida Kogyo Kabushiki Kaisha. Zip fastener construction. 3,855,671, Cl. 24-205.10c.

Fujiwara, Katsuji. Liquid level control valve. 3,856,035, Cl. 137-413.000.

Fujiwara, Yasutaka: *See*—
Nikaido, Teruji; Haga, Kaoru; Sugiyama, Norio; and Fujiwara, Yasutaka, 3,857,071.

Fukuda, Kenzo: *See*—
Kodera, Yoshihide; Todo, Naoyuki; and Fukuda, Kenzo, 3,856,925.

Fukuda, Kouki: *See*—
Kato, Satoru; Fukuda, Kouki; and Nannichi, Kuninobu, 3,856,488.

Fukuoka, Fumiko; Chihara, Goro; and Hamuro, Junji, to Ajinomoto Co., Inc. β-(1>3)-Glucans. 3,856,775, Cl. 260-209.00r.

Fukuzaki, Kazuitsu. Suction cylinder paper forming machine with adjustable doctor knife support structure for controlling paper thickness. 3,856,617, Cl. 162-276.000.

Fuller, Clyde Rhea; and Ghate, Prabhakar Bhimrao, to Texas Instruments, Incorporated. Method of forming contact and interconnect geometries for semiconductor devices and integrated circuits. 3,856,648, Cl. 204-192.000.

Fulton Industries, Inc.: *See*—
Grove, John L., 3,856,108.

Funahashi, Takaji. Pocket hand stamp. 3,855,925, Cl. 101-333.000.

Funk, Clarence J., to United States of America, Navy. Scanning optical imaging system with real-time image thresholding for the elimination of backscattered light. 3,856,988, Cl. 178-6.800.

Fuqua, Lloyd T.: *See*—
Miller, John S.; and Fuqua, Lloyd T., 3,857,056.

Furushima, Masakazu: *See*—
Tsuchiya, Hideshi; Takematsu, Tetsuo; Hasegawa, Yoichi; and Furushima, Masakazu, 3,856,850.

Furuya, Akio; and Ishimaru, Yukihiko, to Dai Nippon Toryo Co. Ltd. and Leben Utility Co. Ltd. Process for molding thermosetting resinous compositions. 3,856,885, Cl. 260-862.000.

G. E. K. Enterprises, Inc.: *See*—
Karkoska, George E., 3,856,302.

Gabbai, Albert: *See*—
Cehovic, Georges; Gabbai, Albert; Marcus, Ilan; and Posternak, Theodore, 3,856,776.

Gabriel, Michel: *See*—
Lefrancois, Robert; Denoyers, Jacques; and Gabriel, Michel, 3,856,916.
Texier, Nicole; Cuer, Jean-Pierre; and Gabriel, Michel, 3,856,917.

Gach, Donald R., to Gach, Robert L.; d/b/a Kilo Engineering Company. Locking knob. 3,855,877, Cl. 74-531.000.

Gach, Robert L.; d/b/a Kilo Engineering Company: *See*—
Gach, Donald R., 3,855,877.

GAF Corporation: *See*—
Erb, Edward R., 3,856,900.
Young, James Leroy, 3,855,891.

Gallagher, Brendan; and Last, Anthony Graham Marshall, to Imperial Chemical Industries, Limited. Dispersion of materials in thermoplastics. 3,856,442, Cl. 425-4.00c.

Gambello, Vincent J.: *See*—
Payne, Calvin L., Jr.; Gambello, Vincent J.; and Molnar, John A., 3,856,303.

Ganzinotti, Jean-Victor, to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber Colombes. Inflatable barriers for watercourses. 3,855,800, Cl. 61-29.000.

Garbalizer Corporation of America: *See*—
Brewer, John C., 3,856,217.

Gardner, Rodney D. Horizontal film editing table. 3,856,389, Cl. 352-129.000.

Garlock, Inc., mesne: *See*—
Kirkland, Kenneth C., Jr.; and Hunt, Raymon E., 3,856,991.

Garrett, Michael R.; Putch, Samuel W.; and Nelson, Norman A., to FMC Corporation. Valve sequence interlock system. 3,856,037, Cl. 137-236.000.

Gartz, Kaj G., to Hansson, K. G., AB. Arrangement for sealing a tube for keeping documents or similar container. 3,856,199, Cl. 229-93.000.

Garvey, Louis P., to General Motors Corporation. Vehicle occupant restraint belt system with comfort clip. 3,856,351, Cl. 297-388.000.

Gates, Robert B. Ladder device. 3,856,109, Cl. 182-84.000.

Gates Rubber Company, The: *See*—
Schnackenberg, Werner D., 3,855,870.
Stuemky, Robert E.; and George, Gene H., 3,855,817.

Gauer, Joseph August: *See*—
Drews, Reinhold Alvin; Rosinski, Alexander B., Jr.; and Gauer, Joseph August, 3,856,036.

Gay, Pierre, to Creusot-Loire Enterprises. Cutting equipment for a multi-line continuous casting plant. 3,855,888, Cl. 83-303.000.

Gaydos, Donald M. Application of flock to the body for cosmetic purposes. 3,856,026, Cl. 132-73.000.

Gebelein, Edward F., Jr., to Chandler Evans Inc. Proportional solenoid actuator. 3,857,081, Cl. 318-687.000.

Gebruder Kollensperger: *See*—
Nogler, Walter, 3,856,421.

Gehring, James H. Locking screw. 3,856,065, Cl. 151-22.000.

Geiss, Richard; and Quarch, Rolf. Solvent based detergent. 3,856,695, Cl. 252-162.000.

Gem Industries, Inc.: *See*—
Neunherz, Herbert W.; Bryant, Robert G.; and Flye, Donald R., 3,855,650.

General Box Company: *See*—
Norgaard, Arthur J., 3,856,178.

General Cable Corporation: *See*—
Saunders, Hollis, S., 3,856,566.

General Concrete Ltd.: *See*—
Aylon, Norman N., 3,855,752.

General Crane Industries Limited: *See*—
Wellman, Donald Edward, 3,856,150.

General Dynamics Corporation: *See*—
Dugan, William P., 3,855,692.
Schaefer, William E.; and Bender, Richard E., 3,856,603.

General Electric Company: *See*—
Cook, Bernard D., 3,856,242.
Fackler, George E., 3,856,058.
Genever-Watling, David C.; and Kast, Howard B., 3,856,201.
Giles, Walter B., 3,855,951.
Grondahl, Clayton M.; and Eskesen, John H., 3,856,433.

Grubb, Willard T., 3,856,636.
Howell, Edward Keith, 3,857,069.
Kendall, Wyvil R., 3,855,684.
Luce, John B., 3,856,887.
Nath, Dilip K., 3,856,698.
Noble, Milton L.; and Snowman, Lawrence R., 3,856,406.
Puckette, Charles McD.; and Butler, Walter J., 3,857,101.
Semon, Howard W., 3,855,741.
Smeggil, John G.; and Charles, Richard J., 3,856,580.
Smeggil, John G.; and Charles, Richard J., 3,856,581.
Smeggil, John G.; and Charles, Richard J., 3,856,582.
Smith, Stanley D.; and Hamilton, Stephen B., Jr., 3,856,839.

General Engineering & Manufacturing Corporation: *See—*
Bell, Richard A.; Wallace, Earl C.; and Winters, Ted W., 3,856,347.

General Foods Corporation: *See—*
Schoonmaker, Charles Donald; Hebel, Carl G.; and Bardsley Robert Francis, 3,855,912.

General Instrument Corporation: *See—*
Varadibriarwood, Andrew G.; Rubinstein, Richard B.; and Radoff, Steven, 3,857,046.

General Metalcraft, Inc.: *See—*
Forsyth, James M., 3,856,371.

General Mills Fun Group, Inc.: *See—*
Grube, John R., 3,856,594.

General Motors Corporation: *See—*
Craig, Gale M., 3,855,844.
Evans, Jesse L.; and Hecker, Eugene L., 3,855,994.
Garvey, Louis P., 3,856,351.
Green, Raymond J.; and Koivunen, Erkki A., 3,855,987.
Harrington, James A., 3,856,119.
Hay, Charles N., 3,856,186.
Langham, Stephen, 3,856,430.
Lindbert, Brook A.; McCollum, Wesley L.; and Mertz, Edward H., 3,856,326.
Manning, Donald L., 3,856,100.
Merrell, Richard L., 3,856,180.
Merrell, Richard L., 3,856,181.
Miller, John S.; and Fuqua, Lloyd T., 3,857,056.
Siegla, Donald C., 3,856,077.
Stang, Karl H., 3,855,955.
Yagiela, Frank D.; and Crowell, Millard D., 3,855,843.

General Properties Anstalt: *See—*
Salvi, Attilio A., 3,856,443.

General Signal Corporation: *See—*
Teague, Roger W.; and Snyder, Richard Paul, 3,856,216.

General Telephone Company of California: *See—*
Norskog, James, 3,855,850.

Genever-Watling, David C.; and Kast, Howard B., to General Electric Company. Temperature regulating control valve. 3,856,201, Cl. 236-93.000.

Genshaw, Marvin Alden; and Smith, Melvin Dee, to Miles Laboratories Inc. Solid state electrode. 3,856,649, Cl. 204-195.00f.

George, Carroll H., to Western Electric Company, Incorporated. Apparatus for feeding and coating masses of workpieces in a controlled atmosphere. 3,856,654, Cl. 204-298.000.

George, Gene H.: *See—*
Stuemky, Robert E.; and George, Gene H., 3,855,817.

George, Louis J.; and Sahatjian, Ronald A., to Polaroid Corporation. Spacer layer for dye diffusion transfer film. 3,856,522, Cl. 96-3.000.

Georgel, Jean: *See—*
Billottet, Henri; Fechner, Patrice; Denoux, Robert; and Georgel, Jean, 3,855,899.

Geppelt, Elmo W. Finned tube heat exchange conductor. 3,856,079, Cl. 165-184.000.

Gerace, Paul L.: *See—*
Taylor, Thomas W.; Ciuffini, Anthony J.; and Gerace, Paul L., 3,856,548.

Gerber Garment Technology, Inc.: *See—*
Pearl, David R.; and Robinson, Samuel Clifford, 3,855,887.

Gerdts, Gustav F., KG: *See—*
Zimmermann, Heino; and Hansemann, Heinrich, 3,855,861.

Germanier, Rene, to Schweizerisches Serum- und Impfinstitut und Institut zur Erforschung der Infektionskrankheiten. Oral typhoid vaccine and method of preparing the same. 3,856,935, Cl. 424-92.000.

Gerresheim, Dusseldorf: *See—*
Waschulewski, Hans-Georg; Baumers, Hans; and Gerresheim, Dusseldorf, 3,856,426.

Gerson, Louis M., Co., Inc.: *See—*
Gerson, Ronald L.; and Caprio, Lawrence A., 3,855,700.

Gerson, Ronald L.; and Caprio, Lawrence A., to Gerson, Louis M., Co., Inc. Blade scraper. 3,855,700, Cl. 30-162.000.

Gesellschaft fur Elektrometallurgie mbH: *See—*
Rothmann, Hans; and Keil, Werner, 3,856,641.

Ghate, Prabhakar Bhimrao: *See—*
Fuller, Clyde Rhea; and Ghate, Prabhakar Bhimrao, 3,856,648.

Ghovanloo, Massud K. Finger game. 3,856,299, Cl. 273-1.00m.

Giannone, Victor S. Tire chain device. 3,856,069, Cl. 152-233.000.

Gibson, Geoffrey Moorhouse: *See—*
Stanbank, Derek James; Leigh, Roland Albert; and Gibson, Geoffrey Moorhouse, 3,856,696.

Gibson, John; and Nelson, James, to Underground Mining Machinery Limited. Chain tensioning devices and drive assemblies for mining. 3,855,871, Cl. 74-242.1fp.

Gibson, Louis J. Hand truck. 3,856,166, Cl. 214-370.000.

Giddings & Lewis, Inc.: *See—*
Seichter, Daniel J.; and Ehrhardt, Orville W., 3,857,051.

Giger, Urs; and Perrot, Friedrich, to ETA A.G. Ebauches-Fabrik. Pivoting device for the winding weight of an automatic watch. 3,855,779, Cl. 58-82.00a.

Gilbert, Frederick W., to Riley-Beaird Inc. Evaporator fabricated from pre-formed sheets. 3,856,630, Cl. 202-173.000.

Giles, Walter B., to General Electric Company. Cyclone incinerator. 3,855,951, Cl. 110-8.00r.

Gillette Company, The: *See—*
Corbett, John Frank; and Fooks, Allen G., 3,856,788.

Giordano, Jean-Louis, to Regie Nationale des Usines Renault and Automobiles Peugeot. Three-way solenoid valves. 3,856,260, Cl. 251-129.000.

Giorgi, Lewis A. Method of making an embossed tridimensional photograph by a dry process. 3,856,592, Cl. 156-59.000.

Girardi, Vincent J., to Babcock & Wilcox Company, The. Broaching machine. 3,855,901, Cl. 90-78.000.

Girault, Pierre: *See—*
Perronnet, Jacques; and Girault, Pierre, 3,856,974.

Givaudan Corporation: *See—*
Wood, Thomas F.; and Heilweil, Emanuel, 3,856,869.
Wood, Thomas F.; and Heilweil, Emanuel, 3,856,875.

Glass, Marvin, & Associates: *See—*
Baer, Marcy L., 3,855,730.
Breslow, Jeffrey D.; and Dunn, Kathy A., 3,856,308.

Glaxo Laboratories, Limited: *See—*
Phillipps, Gordon Hanley; May, Peter John; McDonald, Brian; and Woollett, Edward Arthur, 3,856,828.

Glickman, Sophie, 25% each to Glickman, Sophie E., Thomas, Evelyn, Freedman, Elaine and Zeltcer, Sandra M. Bathtub bench. 3,855,646, Cl. 4-185.00s.

Glickman, Sophie E.: *See—*
Glickman, Sophie, 3,855,646.

Gloucester Engineering Co., Inc.: *See—*
Tiramani, Marco, 3,856,277.

Gnys, Edward L. Necktie shaping device. 3,855,636, Cl. 2-153.000.

Goebels, Siegmund E.: *See—*
Zwettler, Ernst; and Goebels, Siegmund E., 3,857,040.

Goldenberg, Marvin M.: *See—*
Alaimo, Robert J.; and Goldenberg, Marvin M., 3,856,803.
Alaimo, Robert J.; and Goldenberg, Marvin M., 3,856,804.
Wright, George C.; Burch, Homer A.; and Goldenberg, Marvin M., 3,856,825.

Goldstein, Irving: *See—*
United States of America, National Aeronautics and Space Administration, 3,856,402.

Golitz, Hans Dietrich: *See—*
Wagner, Kuno; Oertel, Gunter; Golitz, Hans Dietrich; and Quiring, Bernd, 3,856,756.

Golitz, Ingrid Irene Klarchen: *See—*
Wagner, Kuno; Oertel, Gunter; Golitz, Hans Dietrich; and Quiring, Bernd, 3,856,756.

Golo, Giichi: *See—*
Hiraga, Kentaro; Yoshioka, Kouichi; Golo, Giichi; Nakayama, Ryo; and Masuoka, Michio, 3,856,829.

Goodstal, Laurence: *See—*
English, Myrle H.; Goodstal, Laurence; Leek, Wayne E.; Sanzo, Robert J.; Turner, Robert L.; Workman, Clark B.; and Yetter, Edward W., 3,857,025.

Goodyear Aerospace Corporation: *See—*
McDonald, Wilson C., 3,855,898.

Goodyear Tire & Rubber Company, The: *See—*
Badberg, Melvin C., 3,856,316.
Buckland, Paul S., 3,855,881.
Christie, Christopher E.; Appleby, Paul E.; and Tully, Frank R., 3,856,070.
Hopper, Roger J.; and Lawrence, John P., 3,856,762.
Lovell, John A.; and Harris, Philip G., 3,856,741.
Maxey, Frank S., 3,856,761.
Stalter, Robert J., Sr., 3,855,653.
Steigerwald, John R.; Rasmussen, John P.; and Crapanzano, Angelo T., 3,856,365.
Throckmorton, Morford C.; and Saltman, William M., 3,856,764.

Goodyear Tire and Rubber Company, The: *See—*
Feucht, Robert H., 3,856,052.

Gordon, David A.: *See—*
Bateman, John; and Gordon, David A., 3,856,752.

Gordon, Jerry D. Automatic breading device. 3,855,965, Cl. 118-16.000.

Gorling, Karl Goran: *See—*
Fahlstrom, Per Anders Herman Henningsson; and Gorling, Karl Goran, 3,856,506.

Gorter, Werner, to Semperit Osterreichisch-Amerikanische and Amerikanische Gummiwerke AG. Pneumatic tire. 3,856,067, Cl. 152-209.00r.

Gottfried, Carolyn Jobst: *See—*
Fowler, Susan M.; Gottfried, Carolyn Jobst; Mosiniak, Dennis G.; and Tenteris, Ansis U., 3,856,008.

Gottlieb, Milton: *See—*
Brandt, Gerlad B.; and Gottlieb, Milton, 3,856,378.

Gould Inc.: *See—*
Zoltan, Steven I., 3,857,049.

Gourdon, Claude: *See—*
De Meux, Patrick Delaage; and Gourdon, Claude, 3,857,048.

Gouy, Jean-Claude, to Service d'Exploitation Industrielle des Tabacs et des Allumettes. Device for the continuous feeding of a machine with a strip unwound from successive reels. 3,856,227, Cl. 242-58.300.

Governale, Sandi. Disposable palette. 3,856,136, Cl. 206-1.700.

Grable, Donovan B., 99% to Wasteland Reclamation Corporation, mesne, 1/2 of 1% to Laney, Bill C. and 1/2 of 1% to Haefliger, William W. Pipe transporting and laying vehicle and method. 3,855,807, Cl. 61-72.100.

Grable, Donovan B., 99% to Wasteland Reclamation Corporation, 0.5% to Laney, Bill C. and 0.5% to Haefliger, William W. Recovery of sub-surface metals. 3,856,355, Cl. 299-8.000.

Grace, W. R., & Co.: *See*—
Dighe, Shrikant V.; and Bush, Richard W., 3,856,858.
Lee, Haju; and Rosen, Harvey Milton, 3,856,671.
Morgan, Charles R., 3,856,645.

Graff, Jack: *See*—
Winitz, Milton; and Graff, Jack, 3,856,471.

Graham, Boyd E.; and Skaletzky, Louis L., to Upjohn Company, The. Method for treating hypertension. 3,856,965, Cl. 424-273.000.

Graham, Glen H.: *See*—
West, Charles M.; Graham, Glen H.; and Kennedy, James S., 3,856,891.

Graham, M. H., Corporation: *See*—
Ballard, Neiland H., 3,856,435.

Grambor, Stanley R. Rotary brooms. 3,855,659, Cl. 15-181.000.

Grant, Don S.: *See*—
Cline, Jay D.; and Grant, Don S., 3,857,066.

Granted to the United States National Aeronautics and Space Administration under the provision of 42 U.S.C. 2457: *See*—
Winitz, Milton; and Graff, Jack, 3,856,471.

Granzow, Manfred: *See*—
Wohnhaas, Horst; Haas, Kurt; and Granzow, Manfred, 3,856,367.

Grasser, Katalin: *See*—
Rakoczi, Jozsef; Beck, Ivan; Komlos, Endre; Petocz, Lujza; and Grasser, Katalin, 3,856,778.

Gratzmuller, Jean Louis. Hydropneumatic accumulator. 3,856,048, Cl. 138-31.000.

Gray, Alden J.: *See*—
Terry, Stanley M.; and Gray, Alden J., 3,856,999.

Grazia, Gianni. System and device to compare the phase and frequency between electrical signals. 3,857,103, Cl. 328-133.000.

Grebene, Alan B., to Signetics Corporation. Voltage controlled oscillator with temperature compensating bias source. 3,857,110, Cl. 331-108.00d.

Grechanichenko, Grigory Mikhailovich; Gusinsky, Evgeny Savelievich; Petrukhno, Anatoly Semenovich; and Dobrovolsky, Evgeny Vladimirovich. Method of making plastic coal briquetts. 3,856,481, Cl. 44-10.00h.

Green, Donald R. Vehicle load measuring using a shock absorber and variable resistor. 3,857,093, Cl. 324-65.00r.

Green, Milton: *See*—
Bloom, Stanley M.; and Green, Milton, 3,856,520.

Green, Raymond J.; and Koivunen, Erkki A., to General Motors Corporation. Rotary engine oil lubrication system. 3,855,987, Cl. 123-196.00r.

Greenberg, David R. Self-test arrangement for an entertainment-service system. 3,856,996, Cl. 179-175.000.

Greene, Kenneth F.: *See*—
Benner, Stanley G.; and Greene, Kenneth F., 3,856,544.

Greenwald, Harry, to Craftics, Inc. Method and apparatus for heat softening plastic articles. 3,856,458, Cl. 432-5.000.

Greenwood, Arthur R., to Universal Oil Products Company. Method for solids-withdrawal and transport from a superatmospheric pressure system. 3,856,662, Cl. 208-171.000.

Gregg, Richard C. Rain cap. 3,855,634, Cl. 2-172.000.

Greggshaw, Richard: *See*—
Fan, You Ling; and Greggshaw, Richard, 3,856,606.

Gregorian, Claude: *See*—
Colas, Francois; and Gregorian, Claude, 3,856,202.

Gregorian, Razmic S.; and Hoernle, Hans R., to United Merchants and Manufacturers, Inc. Process for treating fabrics. 3,856,598, Cl. 156-85.000.

Gregory, Lawrence A. Electrical current leakage detector. 3,857,096, Cl. 324-127.000.

Greven, Hendrik Marie, to Akzona Incorporated. Psychopharmacologically active tetra-, penta-, hexa-, and heptapeptides. 3,856,770, Cl. 260-112.500.

Grimm, Peter: *See*—
Simon, Johannes; Etzbach, Volker; Grimm, Peter; and Ford, Wolfgang, 3,855,810.

Grimme, Henry L., Jr.; and Osborn, Ray, to Ray Pak, Inc., mesne. Water purification and vending apparatus. 3,856,676, Cl. 210-96.000.

Griot, Rudolf G., to Sandoz, Inc. 4-p-(ω-Aminoalkoxy)phenyl-1,2-diaryl-cyclopentanes and cyclopentenes. 3,856,863, Cl. 260-570.700.

Grisdale, Patrick J.; and Babb, Bruce E., to Eastman Kodak Company. Photographic compositions and processes. 3,856,531, Cl. 96-91.00n.

Grondahl, Clayton M.; and Eskesen, John H., to General Electric Company. Liquid cooled turbine bucket with dovetailed attachment. 3,856,433, Cl. 416-97.000.

Groppel, Dieter, to Siemens Aktiengesellschaft. Method of producing a structural member formed of electrodes, cover layers and a support frame for fuel elements with a liquid electrolyte, and structural member produced by the method. 3,856,573, Cl. 136-86.0r.

Gross, William J. Self-propelled boat. 3,855,957, Cl. 115-28.00r.

Grossman, Norman R.: *See*—
Rebane, George J.; and Grossman, Norman R., 3,857,022.

Grove, John L., to Fulton Industries, Inc. Three wheel aerial platform apparatus. 3,856,108, Cl. 182-16.000.

Grubb, Willard T., to General Electric Company. Oxygen sensor. 3,856,636, Cl. 204-19.50p.

Grube, John R., to General Mills Fun Group, Inc. Method for making a decorated object. 3,856,594, Cl. 156-63.000.

GTE Sylvania Incorporated: *See*—
Epis, James J., 3,857,112.
Pagnozzi, L. Rita; Kim, Tai K.; Laferty, John M.; and MacInnis, Martin B., 3,856,915.

Gubler, Kurt: *See*—
Kristiansen, Odd; and Gubler, Kurt, 3,856,948.

Guggenheim, Robert Clifton, Sr.; and Liucci, Frank Victor, to International Business Machines Corporation. Crystal indexing fixture. 3,855,738, Cl. 51-217.00r.

Guillaume, Jacques: *See*—
Nedelec, Lucien; Guillaume, Jacques; and Allais, Andre, 3,856,910.

Guillory, Jack P.; and Mathis, Ronald D., to Phillips Petroleum Company. Polyolefins stabilized with nickel or cobalt complexes of halogenated mono or dithio beta diketones. 3,856,750, Cl. 260-45.75n.

Guillot, David G., to Uniroyal, Inc. Reaction product of an organometallic compound and an aminopolyol. 3,856,835, Cl. 260-429.900.

Guion, Christian: *See*—
Boudault, Robert; and Guion, Christian, 3,857,061.

Gulf & Western Manufacturing: *See*—
Lose, John G.; and Roth, John F., 3,855,839.

Gulf Oil Corporation: *See*—
Westling, Randolph E., 3,855,809.

Gulf Research & Development Company: *See*—
Theard, Leslie Peter; Peterson, Frank Clyde; Russell, John Lynn, Jr.; and Reierson, Robert L., 3,856,717.

Gullick Dobson Limited: *See*—
Allen, Archelaius Dawson; and Small, Fred, 3,856,356.

Gumprecht, Donald L.: *See*—
White, James T.; and Gumprecht, Donald L., 3,856,562.

Gusinsky, Evgeny Savelievich: *See*—
Grechanichenko, Grigory Mikhailovich; Gusinsky, Evgeny Savelievich; Petrukhno, Anatoly Semenovich; and Dobrovolsky, Evgeny Vladimirovich, 3,856,481.

Gustafson, August W.; and Gustafson, Edna L. Ball retriever. 3,856,165, Cl. 214-356.000.

Gustafson, David R.: *See*—
Davidson, George R.; and Gustafson, David R., 3,856,619.

Gustafson, Edna L.: *See*—
Gustafson, August W.; and Gustafson, Edna L., 3,856,165.

Haag, Werner O.; and Olson, David H., to Mobil Oil Corporation. Xylene isomerization. 3,856,871, Cl. 260-668.00a.

Haarmann & Reimer GmbH: *See*—
Hopp, Rudolf; and Bauer, Kurt, 3,856,815.

Haas, Kurt: *See*—
Wohnhaas, Horst; Haas, Kurt; and Granzow, Manfred, 3,856,367.

Habasch, Ahmed, to Bosch, Robert, G.m.b.H. Interlock circuit for blocking operation of starter motor of a combustion engine. 3,857,043, Cl. 290-38.000.

Habermeiter, Jurgen; Buxbaum Lothar; and Batzer, Hans, to Ciba-Geigy Corporation. Linear homopolyesters and copolyesters based on methylene-bis (hydroxyalkyldimethyl hydantoins). 3,856,754, Cl. 260-75.00n.

Habicht, Bernard G., to Western Roto Thresh Ltd. Drum for rotary deck thresher. 3,856,023, Cl. 130-27.00q.

Hadomi, Menashe, to CTS Chemicals & Technical Supplies Ltd. Insecticidal compositions and methods of killing insects using a mixture of cytrolone and chlorphenamidine. 3,856,947, Cl. 424-202.000.

Haefliger, William W.: *See*—
Grable, Donovan B., 3,855,807.
Grable, Donovan B., 3,856,355.

Haenisch, Renate: *See*—
Schadlich, Gunther; Haenisch, Renate; and Moraw, Roland, 3,856,529.

Haffner, Donald G.; and Saiia, Anthony J., to Jacobson Manufacturing Company. Sod cutter blade mounting. 3,856,090, Cl. 172-20.000.

Haga, Kaoru: *See*—
Nikaido, Teruji; Haga, Kaoru; Sugiyama, Norio; and Fujiwara, Yasutaka, 3,857,071.

Hagarty, John D., to Johnson, S. C., & Sons, Inc. Alkyl propargyl phosphonates. 3,856,896, Cl. 260-956.000.

Hagger, John Michael Richards: *See*—
Puckowski, Robert Tadeusz; Hagger, John Michael Richards; and Elder, Keith Robert McMillan, 3,856,980.

Hagihara, Tadashi. Self-reconditioning filter apparatus for continuous removal of solids from a stream of liquid. 3,856,678, Cl. 210-160.000.

Hahn, Carl, Dr., KG: *See*—
Simon, Stefan; Wolff, Justus; and Johst, Wolfgang, 3,856,143.

Hahn, Paul B.; Johnson, Dennis C.; Shanks, Howard R.; and Wechter, Margaret A., to Iowa State University Research Foundation Inc. Method for measuring dissolved oxygen in aqueous solution using tungsten bronzes as a potentiometric indicating electrode. 3,86,634, Cl. 204-1.00t.

Hajduk, Thaddeus J.: *See*—

Baur, Leslie L.; and Hajduk, Thaddeus J., 3,856,129.

Haken, Pieter Ten: *See—*
Hunter, Susan E.; Boyce, Clive B. C.; Armitage, Brian P.; Haken, Pieter Ten; and Wagner, Willem M., 3,856,976.

Halasa, Adel F.; and Cheng, Tai Chun, to Firestone Tire & Rubber Company, The. Sodium or potassium hydrocarbon compound and a crown ether as a catalyst composition for polymerization of conjugated dienes. 3,856,768, Cl. 260-94.20m.

Halfar, Kurt; Hitchman, Michael L.; and Mehl, Wolfgang, to Wright, H. Dudley. Production of hydrogen peroxide. 3,856,640, Cl. 204-84.000.

Halfon, Uri; and Niv, Meir. Photo-optical keyboard. 3,856,127, Cl. 197-98.000.

Haller, Clayton L.: *See—*
Lay, Robert; and Haller, Clayton L., 3,857,002.

Halliburton Company: *See—*
Holden, John C.; and Wray, Gary Q., 3,856,085.

Hallman, Hermann; and Perkut, Branko, to MRT Magnet-Regeltechnik GmbH. Magnetically-operated locking mechanisms. 3,855,827, Cl. 70-134.000.

Hamada, Kozo: *See—*
Nagasawa, Taro; Hamada, Kozo; Yuguchi, Hiroya; and Mizuguchi, Kenji, 3,856,627.

Hamb, Fredrick L.; Hiller, Gary L.; and Wise, Albert W., to Eastman Kodak Company. Protective layer for photothermographic elements. 3,856,526, Cl. 96-48.0hd.

Hamb, Fredrick L.; Hiller, Gary L.; and Wise, Albert W., to Eastman Kodak Company. Protective layer for photothermographic elements. 3,856,527, Cl. 96-48.0hd.

Hamill, Robert L.; and Hoehn, Marvin M., to Lilly, Eli, and Company. Ruminant feed utilization improvement. 3,856,940, Cl. 424-121.000.

Hamilton, Curtis A.: *See—*
Lagrange, Don E.; Davis, Edward J.; Scheer, Eugene R.; Brewer, Ralph E.; and Hamilton, Curtis A., 3,857,042.

Hamilton, Stephen B., Jr.: *See—*
Smith, Stanley D.; and Hamilton, Stephen B., Jr., 3,856,839.

Hammann, Ingeborg: *See—*
Sirrenberg, Wilhelm; and Hammann, Ingeborg, 3,856,892.

Hammett, Louis P.: *See—*
Kincaid, John F.; Hammett, Louis P.; and Dailey, Benjamin P., 3,856,590.

Hamuro, Junji: *See—*
Fukuoka, Fumiko; Chihara, Goro; and Hamuro, Junji, 3,856,775.

Hand, David R., to Crossman Arms Company, Inc. Pump-type air gun with tubular valve member. 3,855,989, Cl. 124-13.00a.

Handfield, Guy: *See—*
Palmer, Joseph; and Handfield, Guy, 3,856,512.

Hanka, Ladislav J.; and Martin, David G., to Upjohn Company, The. L-(αS,5S)-α-Amino-3-chloro-2-isoxazoline-5-acetic -isoxazoline-5-acetic acid. 3,856,807, Cl. 260-307.00f.

Hannah, Bruce R.: *See—*
Morrison, Andrew I.; and Hannah, Bruce R., 3,856,353.

Hansemann, Heinrich: *See—*
Zimmermann, Heino; and Hansemann, Heinrich, 3,855,861.

Hansen, Kenneth N., to Allis-Chalmers Corporation. Clutch pedal operated down shifting mechanism. 3,855,875, Cl. 74-481.000.

Hansen Manufacturing Company, The: *See—*
Karcher, Thomas D.; and Antoniw, Walter W., 3,856,336.

Hansson, K. G., AB: *See—*
Gartz, Kaj G., 3,856,199.

Harada, Iki: *See—*
Hayakawa, Masaya; Harada, Iki; and Yamagami, Fumiyoshi, 3,856,135.

Hardy, Clyde. Lifting and lowering device for trailers. 3,856,319, Cl. 280-43.180.

Hardy, Donald F.: *See—*
Campagna, Edward R.; Hardy, Donald F.; Palmer, Thomas W., III; Daugherty, Barney R.; and Letawa, John R., 3,856,498.

Harmon Engineering: *See—*
Harmon, Gardy R.; Norman, John D.; and Tadlock, Guy M., 3,856,218.

Harmon, Gardy R.; Norman, John D.; and Tadlock, Guy M., 75% to Renfroe, R. Bogan and 25% to Harmon Engineering. Waste reduction apparatus. 3,856,218, Cl. 241-186.00r.

Harmon, James F.; Johnston, Richard D.; Lach, John H.; von der Lieth, William H.; and Murphy, Thomas L., to American Potato Company. Apparatus for forming shaped potato pieces from potato dough. 3,855,913, Cl. 99-487.000.

Harnischfeger Corporation: *See—*
Queen, William B., 3,856,102.

Harper, Jack R., to Dow Corning Corporation. Process for molding from a flexible mold. 3,856,908, Cl. 264-313.000.

Harrington, James A., to General Motors Corporation. Transmission brake mechanism. 3,856,119, Cl. 188-82.300.

Harris, Fred T.; and Resler, Edwin L., Jr., to United States of America, Army. Magnetic decelerator for projectiles and system of deceleration and recovery thereof. 3,857,050, Cl. 310-13.000.

Harris, Philip G.: *See—*
Lovell, John A.; and Harris, Philip G., 3,856,741.

Harrison, Henry F.; and Davis, Moses P., Jr., to Minnestoa Mining and Manufacturing Company. High surface area siliceous support. 3,856,706, Cl. 252-450.000.

Harrison, William J., to Photoidetics, Inc. Automatic lens focusing method and apparatus. 3,856,392, Cl. 353-101.000.

Hart, Charles G.: *See—*
Bartlo, John S.; Safranski, Richard W.; Hart, Charles G.; and Wieseckel, David A., 3,856,097.

Hart, David K.: *See—*
Dilello, Carmen J.; and Hart, David K., 3,855,892.

Hartmann, Horst; and Stankewitz, Hans-Werner, to Leitz, Ernst GmbH. Apparatus for no-contact measurement having a multicolored grating. 3,856,400, Cl. 356-28.000.

Hartmann, Otto Ernst, to Cota-Spedition International Container-Transporte GmbH & Co. Large-volume container. 3,856,174, Cl. 220-1.500.

Hartness, Robert G.: *See—*
Hartness, Thomas P.; Hartness, Robert G.; and Hartness, Thomas S., 3,856,059.

Hartness, Thomas P.; Hartness, Robert G.; and Hartness, Thomas S. Container centering device. 3,856,059, Cl. 141-165.000.

Hartness, Thomas S.: *See—*
Hartness, Thomas P.; Hartness, Robert G.; and Hartness, Thomas S., 3,856,059.

Harvey, Sid, Manufacturing Co., Inc.: *See—*
Wittmann, Raymond H., 3,855,882.

Harwood, Lee M. Aquarium. 3,855,970, Cl. 119-5.000.

Hasco-Normalien Hasenclever & Co.: *See—*
Holzmann, Wilfried, 3,856,255.

Hasegawa, Akira: *See—*
Ide, Fumio; Asao, Mamoru; Hasegawa, Akira; and Sasaki, Isao, 3,856,894.

Hasegawa, Yoichi: *See—*
Tsuchiya, Hideshi; Takematsu, Tetsuo; Hasegawa, Yoichi; and Furushima, Masakazu, 3,856,850.

Hashimoto, Masafumi; and Shimura, Yasuo, to Matsushita Electric Industrial Company, Limited. Stabilizing insulation for diffused group III-V devices. 3,856,588, Cl. 148-188.000.

Hauck, Frederic Peter; and Cimarusti, Christopher Michael, to Squibb, E. R., & Sons, Inc. Tricyclic phenoxy aminopropanols. 3,856,818, Cl. 260-340.500.

Haugen, Haakon; and Weetman, David G., to Texaco Inc. Lubricating oil composition. 3,856,691, Cl. 252-52.00r.

Haveg Industries, Inc.: *See—*
Pegg, Ronald L., 3,856,593.

Hay, Charles N., to General Motors Corporation. Pressure vessel fill and bleed valve assembly. 3,856,186, Cl. 222-402.160.

Hayakawa, Masaya; Harada, Iki; and Yamagami, Fumiyoshi, to Bridgestone Tire Company Limited. Conveyor cover assembly. 3,856,135, Cl. 198-204.000.

Hayama, Isao: *See—*
Usui, Keizaburo; Abe, Eiichi; and Hayama, Isao, 3,856,121.

Hayashi, Takao; Matsukawa, Hiroharu; and Kiritani, Masataka, to Fuji Photo Film Co., Ltd. Light-resistant-color developing sheet for pressure-sensitive copying paper. 3,856,553, Cl. 117-36.200.

Hayashida, Kengo: *See—*
Kato, Tadanari; Ikemi, Tadashi; Ooishi, Tutomu; Sano, Mitsuyoshi; Hayashida, Kengo; and Matsumoto, Chinami, 3,856,707.

Hayes, John C., to Universal Oil Products Company. Dehydrogenation with a nonacidic multimetallic catalyst. 3,856,870, Cl. 260-668.00d.

Hayward, Charles R., to Mobil Oil Corporation. Xylene isomerization. 3,856,874, Cl. 260-668.00a.

Heatshield Research and Development Pty. Ltd.: *See—*
Menzies, John Ian; and Menzies, Maureen, 3,856,608.

Hebel, Carl G.: *See—*
Schoonmaker, Charles Donald; Hebel, Carl G.; and Bardsley Robert Francis, 3,855,912.

Heberlein & Co., AG: *See—*
Dosch, Peter; and Dorsch, Dieter, 3,857,098.

Hecker, Eugene L.: *See—*
Evans, Jesse L.; and Hecker, Eugene L., 3,855,994.

Hedman, Clarence L., Jr.; Myrenne, Karl-Dieter S.; and Vartanian, Perry H., Jr., to SCM Corporation. Voltage-controlled dispersion of light by liquid crystals. 3,856,381, Cl. 350-160.0lc.

Heese, William E.: *See—*
Meyer, Kenneth H.; and Heese, William E., 3,855,794.

Heidelberg, Eric X.: *See—*
Brug, James E.; and Heidelberg, Eric X., 3,856,507.

Heilweil, Emanuel: *See—*
Wood, Thomas F.; and Heilweil, Emanuel, 3,856,869.
Wood, Thomas F.; and Heilweil, Emanuel, 3,856,875.

Heimberger, Helmut, to Opti-Holding AG. Slide-fastener stringer. 3,855,673, Cl. 24-205.10c.

Heintzelman, Leo. Baffle filters for carburetors. 3,856,490, Cl. 55-420.000.

Heitmann, Knut; and Schneider, Eckart, to Leitz, Ernst, GmbH. Apparatus for no-contact measurement using an oscillating grating. 3,856,401, Cl. 356-28.000.

Helbing, Clarence R.; Peters, Russel; and Cooper, Hugh E., to Towner Manufacturing Company. Asparagus harvesting apparatus and method. 3,855,764, Cl. 56-327.00a.

Helfgott, Saul, to Field Manufacturing Co., Inc. Chess piece with removable instructional base. 3,856,309, Cl. 273-137.00r.

Heller, Harold: *See—*
Corte, Herbert; Heller, Harold; Lange, Michael; and Netz, Otto, 3,856,715.

Helm, Frederick A. Car top carrier roof or deck lid. 3,856,194, Cl. 224-42.10d.

Hemker, Herman W., to FMC Corporation. Static fluid mixing apparatus. 3,856,270, Cl. 259-4.000.

Hendrickson, Donald Carl: *See*—
Higginbotham, Roy F.; Melugin, Leland A.; and Hendrickson, Donald Carl, 3,857,020.

Henley, James M.; and Thordsen, Earl C. Base construction having self-levelling capability. 3,855,947, Cl. 108-161.000.

Henrick, Clive A.; and Siddall, John B., to Zoecon Corporation. Synthesis of codling moth attactant. 3,856,866, Cl. 260-632.00b.

Henry, Charles Leroy; and McNeely, Gerald Willard, to Akzona Incorporated. Copolyester polymer of enhanced dyeability. 3,856,753, Cl. 260-75.00n.

Henry, Ernest: *See*—
Foster, John; and Henry, Ernest, 3,856,737.

Herbots, Joseph Antoine: *See*—
Van Paesschen, August Jean; Herbots, Joseph Antoine; and Timmerman, Daniel Maurice, 3,856,530.

Herbst, Thomas; and Finsterwalder, Klemens, to Dyckerhoff & Widmann Aktiengesellschaft. Apparatus and method for distending the distensible body of an earth anchor. 3,855,804, Cl. 61-53.600.

Hercules Incorporated: *See*—
Carpenter, Charles W., 3,856,605.
Dickson, Thomas K., 3,856,504.
Diveley, William Russell, 3,856,898.

Herling, Theodore L.: *See*—
Stayton, Leroy M.; and Herling, Theodore L., 3,856,219.

Herman, Marvin J., to Kulo Herman & Modell. Reclining chair. 3,856,346, Cl. 297-61.000.

Hershler, Abe, to Phys-Chemical Research Corporation. Method and apparatus for measuring vapor pressure. 3,856,404, Cl. 356-36.000.

Herzog, Alexis, to Ciba-Geigy Corporation. Method of combating insects. 3,856,950, Cl. 424-225.000.

Hess, Rollie O. Combination granary and feeder for livestock. 3,855,971, Cl. 119-52.0af.

Hester, Jackson B., Jr., to Upjohn Company, The. 2-[2-(Substituted aminomethyl)-4H-1,2,4-thiazol-4-yl]benzophenones. 3,856,792, Cl. 260-247.50r.

Hester, Jackson B., Jr., to Upjohn Company, The. Process for preparing 2,4-dihydro-6-phenyl-1H-s-triazolo [4,3-a][1,4]benzodiazepin-1-one compounds. 3,856,809, Cl. 260-308.00c.

Hetland, Thomas Erwin, to Whirlpool Corporation. Upright vacuum cleaner-drive motor control. 3,857,076, Cl. 318-257.000.

Heynert, Gerhard; and Peters, Karl-Heinz, to August Thyssen-Hutte Aktiengesellschaft. Process for the reduction of iron ores or the like in the production of pig iron in the blast furnace. 3,856,509, Cl. 75-42.000.

Heywang, Hermann; Kobale, Manfred; Preissinger, Karl-Heinz; Ristow, Dietrich; and Wehnelt, Ulrich, to Siemens Aktiengesellschaft. Electrical capacitors and method of making same. 3,857,074, Cl. 317-258.000.

Hickey, Roy E.; and Sanderson, William R., to Singer Company, The. Slide tray and slide positioning mechanism. 3,856,391, Cl. 353-88.000.

Hickner, George B.: *See*—
Lewis, Richard L.; and Hickner, George B., 3,856,105.

Hickson, John D. Pressure spray can holding and operating apparatus. 3,856,209, Cl. 239-532.000.

Hidalgo, John: *See*—
Thompson, Charles R.; and Hidalgo, John, 3,856,963.

Hidalgo-Briceno, Miguel, 10% to Aagaard de Hidalgo, Antonia and 45% to Nolfi, Luigi Mari. Entertainment device. 3,855,998, Cl. 128-2.10b.

Higginbotham, Roy F.; Melugin, Leland A.; and Hendrickson, Donald Carl; deceased (by Stanford, William L.; administrator), to Datatype Corporation. Automatic line tracker. 3,857,020, Cl. 235-61.11e.

Hildebrand, Ed., Ing., AG: *See*—
Hildebrand, Eduard, 3,856,572.

Hildebrand, Eduard, to Hildebrand, Ed., Ing., AG. Apparatus for cleaning utensils or the like. 3,856,572, Cl. 134-76.000.

Hildreth, Clarence L.: *See*—
Becker, Warren E.; Johnston, James D.; and Hildreth, Clarence L., 3,856,511.

Hill, Jan Erik; Eriksson, Erik Lennart; and Lennartsson, Mats, to Svenska Traforskningsinstitutet. Apparatus for measuring the optically birefringent properties of a liquid sample. 3,856,408, Cl. 356-114.000.

Hill, William J., to Morgan Construction Company. Magnet holder for material handling apparatus. 3,856,157, Cl. 214-1.0bt.

Hiller, Gary L.: *See*—
Hamb, Fredrick L.; Hiller, Gary L.; and Wise, Albert W., 3,856,526.
Hamb, Fredrick L.; Hiller, Gary L.; and Wise, Albert W., 3,856,527.

Hines, Edward, Lumber Co.: *See*—
Miles, Thomas R., 3,856,061.

Hinze, Klaus, to Schadow, Rudolf, Firma KG. Indicating push button for push button switches. 3,855,959, Cl. 116-124.00r.

Hiraga, Kentaro; Yoshioka, Kouichi; Golo, Giichi; Nakayama, Ryo; and Masuoka, Michio, to Takeda Chemical Industries, Ltd. 16β-Hydrocarbon substituted estrane compounds. 3,856,829, Cl. 260-397.400.

Hirakawa, Michio: *See*—
Yamaguchi, Tadashi; Ono, Takayuki; Hoshi, Hiroshi; Hirakawa, Michio; and Watanabe, Isao, 3,856,745.

Hirano, Masachika: *See*—
Fujimoto, Keimei; Hirano, Masachika; Takeda, Hisami; and Ooba, Shigehiro, 3,856,972.

Hirmann, Georg, to Polyprodukte, AG. Method and apparatus for measuring chassis geometry. 3,855,709, Cl. 33-203.150.

Hirooka, Masaaki: *See*—
Mori, Kenjiro; Ikebe, Shigueaqui; Hirooka, Masaaki; and Kato, Takashi, 3,856,685.

Hirsch, Jean-Jacques; Mayeur, Eugene; and Mayeur, Jacky, to Societe en Commandite par Actions dite: Adolphe et Andre Caen. Shuttle control device for a loom. 3,856,055, Cl. 139-138.000.

Hit-Away, Inc.: *See*—
Ettinger, Donald N., 3,855,631.

Hitachi, Ltd.: *See*—
Daimon, Goro; Nakano, Seizo; and Kishi, Tuneo, 3,857,006.
Kamo, Yasuo, 3,856,623.
Kitanosono, Hidehiro; Kubo, Takeaki; and Shida, Shigeru, 3,855,830.
Takahashi, Reijiro; Kanemoto, Kazuo; and Ito, Toshikatu, 3,855,836.

Hitchman, Michael L.: *See*—
Halfar, Kurt; Hitchman, Michael L.; and Mehl, Wolfgang, 3,856,640.

Hitzman, Donald O., to Phillips Petroleum Company. Microbial synthesis from aldehyde containing hydrocarbon derived products. 3,856,774, Cl. 260-209.00r.

Hobart Corporation: *See*—
Waters, Barrett Bradford, 3,856,220.

Hochreuter, Johann. Shear pin safety coupling. 3,855,818, Cl. 64-28.00r.

Hodgson, James H., to Chromalloy American Corporation. Flail type material spreader. 3,856,210, Cl. 239-658.000.

Hoechst Aktiengesellschaft: *See*—
Klug, Helmut; and Mukerjee, Ambar Nath, 3,856,766.

Hoechst Aktiengesellschaft, mesne: *See*—
Vogt, Wilhelm; Fischer, Edgar; and Auer, Eberhard, 3,856,755.

Hoehn, Hans: *See*—
Denzel, Theodor; and Hoehn, Hans, 3,855,675.

Hoehn, Hans; and Denzel, Theodor, to Squibb, E. R., & Sons, Inc. Intermediates for production of amino derivatives of pyrazolopyridine carboxylic acids and esters. 3,856,799, Cl. 260-295.50r.

Hoehn, Marvin M.: *See*—
Hamill, Robert L.; and Hoehn, Marvin M., 3,856,940.

Hoehring Company: *See*—
Parrett, John T.; and Frazer, David S., 3,856,152.

Hoernle, Hans R.: *See*—
Gregorian, Razmic S.; and Hoernle, Hans R., 3,856,598.

Hoeschele, Guenther Kurt, to Du Pont de Nemours, E. I., and Company. Stabilization of polymers containing poly(alkylene oxide) units. 3,856,749, Cl. 260-45.9nc.

Hoffman-La Roche, Inc.: *See*—
Cohen, Noal, 3,856,864.

Hoffmann, Joseph H., to Westinghouse Electric Corporation. Centrifugal fan wheel. 3,856,434, Cl. 416-184.000.

Hoffmann-La Roche Inc.: *See*—
Rosenberger, Michael; and Saucy, Gabriel, 3,856,817.
Saucy, Gabriel, 3,856,861.

Hofmann & Co. KG: *See*—
Kirst, Rudi, 3,855,902.

Hojo, Takeshi: *See*—
Kawada, Shin-Ichi; and Hojo, Takeshi, 3,855,711.

Hoke, Donald Irvin, to Lubrizol Corporation, The. Oil-soluble polymers of N-3-aminoalkyl acrylamides, and lubricants containing them. 3,856,689, Cl. 252-51.50a.

Holden, John C.; and Wray, Gary Q., to Halliburton Company. Annulus pressure operated well testing apparatus and its method of operation. 3,856,085, Cl. 166-264.000.

Holec N.V.: *See*—
Brinkman, Willem, 3,855,982.

Holland, Gerald Fagan. Substituted benzoic acid hypoliphemic agents. 3,856,951, Cl. 424-230.000.

Hollenbeck, Perry T. Articulated multiple section snowmobile ski. 3,856,318, Cl. 280-28.000.

Hollymatic Corporation, mesne: *See*—
Wagner, Richard C., 3,855,815.

Holmes, James J.: *See*—
Bates, John F.; Holmes, James J.; Paxton, Michael M.; and Straalsund, Jerry L., 3,856,517.

Holstein & Kappert Maschinenfabrik "Phonix" GmbH: *See*—
Muller, Friedhelm, 3,856,343.

Holt, Lloyd J.: *See*—
Bens, Everett M.; and Holt, Lloyd J., 3,856,550.

Holt, Ronald: *See*—
Walter, Frederick L.; and Holt, Ronald, 3,855,758.

Holtey, Thomas O., to Honeywell Information Systems, Inc. Card reader data logic with position indication and error detection. 3,857,019, Cl. 235-61.11a.

Holzinger, Karl, to Kannegisser, Herbert, Kommanditgesellschaft. Device for producing moldings from foamable plastics, more particularly, polyurethane. 3,856,451, Cl. 425-429.000.

Holzmann, Wilfried, to Hasco-Normalien Hasenclever & Co. Apparatus for the fabrication of injection-molded or die-cast articles. 3,856,255, Cl. 249-59.000.

Homeyer, Bernhard: *See*—
Schrader, Gerhard; and Homeyer, Bernhard, 3,856,949.

Homolka, George A. J., to Texaco, Inc. Gas specific gravity meter. 3,855,845, Cl. 73-30.000.

Honeywell Inc.: *See—*
Kishimoto, Hiroyuki; and Morozumi, Eiichi, 3,855,865.

Honeywell Information Systems, Inc.: *See—*
Holtey, Thomas O., 3,857,019.
Umbaugh, Charles Wayne, 3,855,693.

Honjo, Satoru; and Sato, Masamichi, to Xerox Corporation. Transfer of tower using a volatile insulating liquid. 3,856,519, Cl. 96-1.400.

Honma, Seishi; and Fujii, Yoshihisa, to Kabushiki Kaisha Hasegawa Haguruma. Double mesh type W-N gear. 3,855,874, Cl. 74-462.000.

Hopp, Rudolf; and Bauer, Kurt, to Haarmann & Reimer GmbH. Process for the production of oxa-bicyclo alkenes. 3,856,815, Cl. 260-333.000.

Hopp, Theodore H.: *See—*
Lieberman, Stuart I.; and Hopp, Theodore H., 3,857,107.

Hoppe, Lutz; and Behn, Rudolf, to Wolff Walsrode Aktiengesellschaft. Process for improving the anti-friction properties of polymeric substances. 3,856,742, Cl. 260-37.00n.

Hoppe, Walter, to Max-Plank-Gesellschaft zur Forderung der Wissenschafter e.V. Scanning charged beam particle beam microscope. 3,857,034, Cl. 250-311.000.

Hopper, Roger J.; and Lawrence, John P., to Goodyear Tire & Rubber Company, The. Sulfonamide additives for sulfur vulcanizable polymers. 3,856,762, Cl. 260-79.50b.

Hori, Hideo, to Hori Lock Kogyo Kabushiki Kaisha. Padlock. 3,855,826, Cl. 70-38.00a.

Hori, Kiyokazu: *See—*
Yoshizawa, Toshio; Yamada, Yasuo; Taniguchi, Toshinori; Kose, Tatsuo; Ohchi, Kazuo; and Hori, Kiyokazu, 3,855,771.

Hori Lock Kogyo Kabushiki Kaisha: *See—*
Hori, Hideo, 3,855,826.

Horii, Hideo: *See—*
Otsuki, Yutaka; Imai, Hirosuke; Kaiya, Atsushi; and Horii, Hideo, 3,856,877.

Horizons Incorporated; a division of Horizons Research Incorporated: *See—*
Reynard, Kennard A.; and Rose, Selwyn H., 3,856,712.
Rose, Selwyn H.; and Reynard, Kennard A., 3,856,713.

Horsey, Robert W.; and Brychta, Emil John. Apparatus for producing core yarn for antistatic carpet. 3,855,767, Cl. 57-18.000.

Hoshi, Hiroshi: *See—*
Susuki, Rinnosuke; Hoshi, Hiroshi; Satto, Jiro; Takano, Koichi; and Kosikawa, Kiyoshi, 3,856,614.
Susuki, Rinnosuke; Hoshi, Hiroshi; Saito, Jiro; Murakami, Keiichi; and Yamada, Hisashi, 3,856,746.
Yamaguchi, Tadashi; Ono, Takayuki; Hoshi, Hiroshi; Hirakawa, Michio; and Watanabe, Isao, 3,856,745.

Hosoe, Kazuya; and Matsumoto, Seiichi, to Canon Kabushiki Kaisha. Automatically adjustable focusing system. 3,856,399, Cl. 356-1.000.

Hosono, Hiroo; Minamide, Seiko; Hukushima, Juichi; Kudou, Yoku; and Kimura, Shunichiro, to Matsushita Electric Industrial Co., Ltd. Tape reel. 3,856,228, Cl. 242-71.800.

Houlihan, William J.: *See—*
Cooke, George A.; and Houlihan, William J., 3,856,960.

Householder, Kermit W., to Dow Corning Corporation. Antifoam composition. 3,856,701, Cl. 252-358.000.

Housley, John Rosindale: *See—*
Oxley, Peter; and Housley, John Rosindale, 3,856,956.

Howard, Donald W., to Bendix Corporation, The. Electronically controlled solenoid regulated servomotor. 3,856,362, Cl. 303-7.000.

Howell, Edward Keith, to General Electric Company. Ground fault circuit interrupter and module therefor. 3,857,069, Cl. 317-18.00d.

Howle, Clement Roger, to Aluminum Company of America. Continuously cast plate with textured surface. 3,856,479, Cl. 29-183.000.

Howorth Air Conditioning Limited: *See—*
Howorth, Frederick Hugh, 3,855,770.

Howorth, Frederick Hugh, to Howorth Air Conditioning Limited. Machines acting on continuously running textile yarns. 3,855,770, Cl. 57-34.500.

Hoyer, Ernst; and Schladetsch, Hans Jakob, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Water insoluble 4-(2'-cyano-4'-nitrophenylazo)-2-chloro-N-(β-cyanoethyl)-aniline. 3,856,773, Cl. 260-205.000.

Hoyer, Otto, to Vereinigte Osterreichische Eisen- und Stahlwerke Alpine Montan Aktiengesellschaft. Container for hot liquid metals. 3,856,284, Cl. 266-34.0pp.

Hoyt, Harold R.; and Hoyt, Marjorie. Egg blowing device. 3,855,915, Cl. 99-495.000.

Hoyt, Marjorie: *See—*
Hoyt, Harold R.; and Hoyt, Marjorie, 3,855,915.

Hsu, Charles F.; Jiu, James; and Mizuba, Seth Setsuo, to Searle, G. D., & Co. 15(S), 18-Dihydroxy-9-oxo-5-cis-13-trans-prostadienoic acid. 3,856,852, Cl. 260-514.00d.

Huang, Ho-Chung, to RCA Corporation. Microwave acoustic delay line. 3,857,113, Cl. 333-30.00r.

Hubele, Adolf, to Ciba-Geigy Limited A.G. Control of acarinae with carbamates having an oxime ether function. 3,856,973, Cl. 424-300.000.

Huber, Charles N. Chromatography apparatus and method. 3,856,681, Cl. 210-198.00c.

Huber, Ludwig Konrad, to Pennwalt Corporation. Sulfonyldiisocyanate adducts. 3,856,786, Cl. 260-243.00r.

Huber, Ludwig Konrad, to Pennwalt Corporation. Synergistic antimicrobial compositions employing certain N-(phenyl-carbanyl) amino-benzene sulfonyl flourides. 3,856,952, Cl. 424-233.000.

Huber-Emden, Helmut; and Schafer, Paul, to Ciba-Geigy Corporation. Carboxylic acid perfluoroalkyl esters. 3,856,849, Cl. 260-486.00h.

Huddle, Carl F., to Tension Structures Co. Damping means for portable structures. 3,856,029, Cl. 135-1.000.

Hudgins, Robert R.: *See—*
Silveston, Peter L.; and Hudgins, Robert R., 3,856,927.

Huffaker, Robert M.: *See—*
United States of America, National Aeronautics and Space Administration, 3,856,402.

Hughes, Carroll T., Jr.; and Fishback, James K., to Consumat Systems, Inc. Automatic loading and ash removal system for incinerators. 3,855,950, Cl. 110-8.00c.

Hughes, Herbert Denis, to Alkaline Batteries Limited. Electric cell with wide and narrow positive and negative plates and plate strap attachment. 3,856,575, Cl. 136-134.000.

Hughes, John Joseph: *See—*
Napoli, Louis Sebastian; and Hughes, John Joseph, 3,856,591.

Hugon, Pierre: *See—*
Beregi, Laszlo; Hugon, Pierre; and Le Douarec, Jean-Claude, 3,856,857.

Hukushima, Juichi: *See—*
Hosono, Hiroo; Minamide, Seiko; Hukushima, Juichi; Kudou, Yoku; and Kimura, Shunichiro, 3,856,228.

Hummel, Merritt J., to PPG Industries, Inc. Method of making crystallized glass. 3,856,497, Cl. 65-33.000.

Hunt, Raymon E.: *See—*
Kirkland, Kenneth C., Jr.; and Hunt, Raymon E., 3,856,991.

Hunter, Lee. Method of testing vehicle shock absorbers and apparatus therefor. 3,855,841, Cl. 73-11.000.

Hunter, Susan E.; Boyce, Clive B. C.; Armitage, Brian P.; Haken, Pieter Ten; and Wagner, Willem M., to Shell Oil Company. Cyclopropane derivative fungicides. 3,856,976, Cl. 424-317.000.

Hurley, Raymond E., to Owens-Corning Fiberglas Corporation. Apparatus for winding a plurality of linear materials. 3,855,774, Cl. 57-81.000.

Hutchinson, Harold D. Ski boot load distributor for lower leg. 3,855,716, Cl. 36-2.5al.

Hutchison, Arthur H.; and McMillian, Lonnie S., to Abbott Laboratories. Gas-filled tube control apparatus and method. 3,857,065, Cl. 315-340.000.

Hutchison, Stanley O.; Anderson, Glenn W.; and Newby, Gordon L., to Chevron Research Company. Impression packer. 3,855,854, Cl. 73-151.000.

Hutchison, Stanley O.; Anderson, Glenn W.; and Newby, Gordon L., to Chevron Research Company. Impression packer. 3,855,855, Cl. 73-151.000.

Hutchison, Stanley O.; Anderson, Glenn W.; and Newby, Gordon L., to Chevron Research Company. Impression packer. 3,855,856, Cl. 73-151.000.

Hutton, Robert Christopher: *See—*
Clark, Dennis Edward; and Hutton, Robert Christopher, 3,856,779.

Hybrid Systems Corporation: *See—*
Wilensky, Samuel; and Roberge, James K., 3,857,021.

Hydrapower Inc.: *See—*
Meyer, Kenneth H.; and Heese, William E., 3,855,794.

Hydril Company: *See—*
Mott, James D., 3,856,083.

Hydrocarbon Research Inc.: *See—*
Wolk, Ronald H.; and Chervenak, Michael C., 3,856,658.

Hynds, William B. Aerodynamic toy. 3,855,728, Cl. 46-74.00d.

Hynes, Frank R.: *See—*
Lynch, Thomas; Berner, Douglas G.; and Hynes, Frank R., 3,855,890.

Hynes, Frank R.; May, Joseph N.; and Thompson, David M., to Xerox Corporation. Developing system for film by adiabatic heat flow. 3,856,460, Cl. 432-59.000.

Iacoviello, John G., to Air Products and Chemicals, Inc. Aqueous emulsion of interpolymer of vinyl acetate N-methylol acrylamide and acrylic acid. 3,856,734, Cl. 260-29.6ta.

Ichiko Industries Limited: *See—*
Yamashita, Makoto; Ikura, Kenkichi; and Kushida, Masagoro, 3,856,383.

Ichimaru, Yoshiro: *See—*
Kakizaki, Tadao; Ichimaru, Yoshiro; and Arai, Ryozo, 3,856,195.

ICI American Inc.: *See—*
Ferguson, Christopher A., 3,856,535.

ICI United States Inc.: *See—*
Miller, Alfred D., 3,856,783.

Ide, Fumio; Asao, Mamoru; Hasegawa, Akira; and Sasaki, Isao, to Mitsubishi Rayon Co., Ltd. Vinyl chloride polymer composition containing a crosslinked methyl methacrylate copolymer. 3,856,894, Cl. 260-899.000.

Ide, Susumu: *See—*
Uchida, Kosaku; Ide, Susumu; Kanamaru, Toshiji; and Kitamura, Sadafumi, 3,855,962.
Uchida, Kosaku; Ide, Susumu; Kanamaru, Toshiji; and Kitamura, Sadafumi, 3,855,964.

Iglesias, Jose J. Stabilized cutting loop for resectoscope. 3,856,015, Cl. 128-303.150.

Igloo-Flex AB: *See—*

Sund, Eri'. Ivar, 3,856,072.
Iguchi, Hideo: *See—*
Kolshi, Hitoshi; Takao, Michio; Oda, Yasuhiro; Iguchi, Hideo; and Kohase, Shigeru, 3,856,759.
Iijima, Akira; Yokoyama, Yujiro; Yamada, Yosuke; and Kimura, Makoto, to Toyo Soda Manufacturing Co., Ltd. and Japan Steel Works, Limited, The. Multi-core circular die for preparing multilayer. 3,856,448, Cl. 425-133.100.
Ikebe, Shigueaqui: *See—*
Mori, Kenjiro; Ikebe, Shigueaqui; Hirooka, Masaaki; and Kato, Takashi, 3,856,685.
Ikeda, Yoshiro: *See—*
Kitano, Ichiro; and Ikeda, Yoshiro, 3,856,494.
Ikemi, Tadashi: *See—*
Kato, Tadanari; Ikemi, Tadashi; Ooishi, Tutomu; Sano, Mitsuyoshi; Hayashida, Kengo; and Matsumoto, Chinami, 3,856,707.
Ikura, Kenkichi: *See—*
Yamashita, Makoto; Ikura, Kenkichi; and Kushida, Masagoro, 3,856,383.
Ilford Limited: *See—*
Thurston, Elvin Frederick William; and Scott, John Gabriel Valentine, 3,856,532.
Illinois Tool Works Inc.: *See—*
Knohl, Friedrich Karl, 3,855,688.
Reynolds, Richard L., 3,856,066.
Imabori, Junpei; Kuzuoka, Takeshi; and Mori, Atsuhiko, to Sumitomo Rubber Industries, Ltd. Apparatus for testing golf clubs. 3,855,842, Cl. 73-13.000.
Imai, Hirosuke: *See—*
Otsuki, Yutaka; Imai, Hirosuke; Kaiya, Atsushi; and Horii, Hideo, 3,856,877.
Imatt, Alexander; and Brand, Derek A. Archery bow with arrow guide means in hand grip. 3,855,991, Cl. 124-24.00r.
Imperial Chemical Industries, Limited: *See—*
Allen, Maurice, 3,856,543.
Gallagher, Brendan; and Last, Anthony Graham Marshall, 3,856,442.
Imrie, Frazer Keith Elliott, to Tate & Lyle Limited. Process for the production of polysaccharide. 3,856,625, Cl. 195-31.00p.
Industrial Nucleonics Corporation: *See—*
McCall, Robert Eugene, 3,857,023.
Industrie Pirelli S.p.A.: *See—*
Cicognani, Marion, 3,856,907.
Ingerslev, Eric, to Island International Engineers Limited. Pipeline structure. 3,856,053, Cl. 138-153.000.
Inoue, Takuji, to Sony Corporation. Method for manufacturing cathode ray tube screen. 3,856,525, Cl. 96-36.100.
Institut de Recherches de la Siderurgie Francaise (IRSID): *See—*
Berthet, Aristide; and Blum, Jacques, 3,856,182.
Institut Francais du Petrole des Carburants et Lubrifiants: *See—*
Sugier, Andre; and Miquel, Jean, 3,856,661.
Institute of Gas Technology, The: *See—*
Klass, Donald L., 3,856,492.
Integrated Sciences Corporation: *See—*
Rebane, George J.; and Grossman, Norman R., 3,857,022.
Intellectual Property Development Corporation: *See—*
Saltzman, William H., 3,856,953.
Inter Dyne: *See—*
Betts, Paul J., 3,855,647.
Inter Textiles Europeen: *See—*
Valdelievre, Etienne, 3,855,775.
Interlake Inc.: *See—*
Busam, Donald H., 3,855,935.
International Business Machines Corporation: *See—*
Blachman, Arthur Gilbert, 3,856,647.
Byram, James Warren, 3,856,229.
Closs, Felix H.; Mueller, Hans R.; and Wild, Daniel, 3,856,993.
Guggenheim, Robert Clifton, Sr.; and Liucci, Frank Victor, 3,855,738.
Jablonski, Richard B.; and Martone, James F., 3,856,554.
International Computers Limited: *See—*
Cuttell, Willis Robert; and Truman, Norman Nathan, 3,856,557.
International Harvester Company: *See—*
Quick, Donald J., 3,855,954.
Scofield, Bruce A., 3,855,973.
International Standard Electric Corporation: *See—*
Cragg, William Donald; and Bradley, Stuart, 3,856,995.
Lawson, Anthony Newton; and Tabalba, Camilo Manasala, 3,856,982.
International Telephone and Telegraph Corporation: *See—*
Sears, Karl David, 3,856,845.
International Telephone and Telegraph Corporation, mesne: *See—*
Kaufman, Bruce L., 3,855,896.
Interstop AG: *See—*
Meier, Ernst, 3,856,189.
Invacare Corporation: *See—*
Pivacek, William J., 3,855,654.
Iowa State University Research Foundation, Inc.: *See—*
Buchele, Wesley F.; and Mahmoud, Ali R., 3,856,022.
Hahn, Paul B.; Johnson, Dennis C.; Shanks, Howard R.; and Wechter, Margaret A., 3,856,634.
Ippolito, Oscar S. Bag closure. 3,856,062, Cl. 150-3.000.
Ipsen Industries International, Gesellschaft mit beschrankter Haftung: *See—*
Burmeister, Karl-Heinz, 3,855,993.
Ishido, Yoshiharu; Yoshino, Teruo; Komura, Hajime; Suzuki, Katsumi; Yamasaki, Akihiro; and Okutsu, Masaru, to Ajinomoto Co., Inc. Method of producing pyrimidine nucleoside derivatives. 3,856,777, Cl. 260-211.50r.
Ishii, Kenjiro: *See—*
Suzuki, Hidenori; Maeda, Katsumi; Nakatani, Keiji; and Ishii, Kenjiro, 3,856,397.
Ishikawa Tekko Kabushiki Kaisha: *See—*
Uchida, Yasuo, 3,856,423.
Ishimaru, Wataru; and Miyauchi, Toshiyuki, to Nissan Motor Company, Limited. Hydraulic pressure control system for an automatic power transmission. 3,855,880, Cl. 74-868.000.
Ishimaru, Yukihiko: *See—*
Furuya, Akio; and Ishimaru, Yukihiko, 3,856,885.
Ishiyama, Tetsuji: *See—*
Umezawa, Hamao; Okami, Yoshiro; Takeuchi, Tomio; and Ishiyama, Tetsuji, 3,856,969.
Ishizuka, Hiroshi. Process for refining zirconium tetrachloride containing hafnium tetrachloride. 3,856,477, Cl. 23-294.000.
Island International Engineers Limited: *See—*
Ingerslev, Eric, 3,856,053.
Israel Aircraft Industries Ltd.: *See—*
Cina, Baruch M., 3,856,584.
Ito, Kenichi: *See—*
Yokoi, Hiromu; Ito, Kenichi; and Mizobuchi, Kenji, 3,856,985.
Ito, Takuma: *See—*
Yashima, Saburo; Manabe, Haruo; Ito, Takuma; and Namikawa, Keishi, 3,856,666.
Ito, Toshikatu: *See—*
Takahashi, Reijiro; Kanemoto, Kazuo; and Ito, Toshikatu, 3,855,836.
Ito, Yoichiro; and Bosman, Robert L., to United States of America, Health, Education and Welfare. Elution centrifuge-apparatus and method. 3,856,669, Cl. 210-31.00c.
Itoh, Takane, to Nissan Motor Company, Limited. Flow control valve. 3,856,034, Cl. 137-117.000.
Iura, Yukihide: *See—*
Nishino, Atsushi; Kumano, Hiroshi; and Iura, Yukihide, 3,855,914.
Iwanaga, Yukio: *See—*
Tateishi, Teizabro; Murase, Koichi; and Iwanaga, Yukio, 3,856,831.
Iwata, Tokushige; Sakamoto, Kiyoaki; Nawata, Teruo; Endo, Hiroyasu; Nakano, Masaru; and Murayama, Hajime, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha and Mitsubishi Kinzoku Kogyo Kabushiki Kaisha. Fe-Mo-C-[Cr] sintered alloys for valve seats. 3,856,478, C. 29-182.000.
Jablonski, Richard B.; and Martone, James F., to International Business Machines Corporation. Pressure-sensitive carbonless transfer sheet and method for providing a chemically formed image on an untreated substrate. 3,856,554, Cl. 117-36.800.
Jablonsky, Erich, to Zahnradfabrik Friedrichshafen AG. Auxiliary power steering system. 3,855,904, Cl. 91-359.000.
Jackson Communication Corporation: *See—*
Jackson, Richard L., 3,855,838.
Jackson, Ivan, to Squibb, E. R., & Sons, Inc. Topical steroid compositions. 3,856,954, Cl. 424-241.000.
Jackson, Richard L., to Jackson Communication Corporation. Apparatus for forming variable length cable offsets. 3,855,838, Cl. 72-389.000.
Jackson, Richard L. Pool skimmer net. 3,856,679, Cl. 210-169.000.
Jackson, Richard L., to Lilly, Eli, and Company. Process for manufacturing alkali metal or ammonium insulin. 3,856,771, Cl. 260-112.700.
Jacobi, Arno M., Sr., to Jacobi, Walter, & Sons, Inc. Stackable chair kneeler. 3,856,352, Cl. 297-425.000.
Jacobi, Walter, & Sons, Inc.: *See—*
Jacobi, Arno M., Sr., 3,856,352.
Jacobs, Christopher A. Capacitive discharge ignition system having variable capacitance. 3,855,984, Cl. 123-148.00e.
Jacobson Manufacturing Company: *See—*
Haffner, Donald G.; and Saiia, Anthony J., 3,856,090.
Jaenichen, Gunther: *See—*
Menzel, Gerhard; Seidel, Eckhard; and Jaenichen, Gunther, 3,856,726.
James, Dennis Bryan; and McEowen, James Royce, to Bell Telephone Laboratories, Incorporated. Relay release timing control circuit. 3,857,072, Cl. 317-141.00r.
Jan Verstegen, Judicus Marinus Pieter; and De Meester, Emiel Petrus Juliaan, to U.S. Philips Corporation. Luminescent alkali metal gallate. 3,856,697, Cl. 252-301.40r.
Jankowiak, Erwin M.; Niles, Earl Thomas; and Lane, George A., to Dow Chemical Company, The. Pyrotechnic disseminating system. 3,856,933, Cl. 424-42.000.
Jankowiak, Roman: *See—*
Fisher, Edward; Rautio, Wilbur S.; Jankowiak, Roman; and Natell, Richard W., 3,856,983.
Janous, Donald Frank: *See—*
Kenny, Andrew Augustine; Larson, Richard Kendall; and Janous, Donald Frank, 3,856,045.
Japan Steel Works, Limited, The: *See—*
Iijima, Akira; Yokoyama, Yujiro; Yamada, Yosuke; and Kimura, Makoto, 3,856,448.
Japan Styrene Paper Incorporation: *See—*

Miyamoto, Akira; Akiyama, Hiroyuki; Noguchi, Toshiaki; and Ohtsuka, Isao, 3,856,719.

Japan Synthetic Rubber Co. Ltd.: *See—*
Shimozato, Joji; Umeno, Masashi; and Yabuta, Shiro, 3,856,729.

Jarvis, Edward C. Accessory rim with dental bite correlator and impression aid. 3,855,703, Cl. 32-17.000.

Jefferson Chemical Company, Inc.: *See—*
Cavitt, Stanley Bruce, 3,856,826.
Cavitt, Stanley Bruce, 3,856,827.

Jelalian, Albert V.: *See—*
United States of America, National Aeronautics and Space Administration, 3,856,402.

Jenkins, Frank Llewellyn, to Wiggins Teape Research & Development Limited. Pressure sensitive copying paper. 3,856,551, Cl. 117-36.200.

Jenkins, Victor Frederick; and Doherty, Daniel Anthony, to Laporte Industries Limited. High density polyurethane foams. 3,856,716, Cl. 260-2.5bd.

Jensen, Dennis H.; and McKinley, Thomas E., to M. J. Manufacturing Consultants, Inc. Apparatus for compressing article holding racks. 3,856,290, Cl. 269-14.000.

Jentzen-Miller Company, The: *See—*
Olinick, Robert F., 3,856,148.

Jesevich, John; and Simkus, Vyto, to American Flange & Manufacturing Co., Inc. Closure feeding method. 3,856,162, Cl. 214-152.000.

Jeter, John D., to Texas Dynamatics, Inc. Apparatus for prestressing a structural member. 3,855,742, Cl. 52-98.000.

Jex Co., Ltd.: *See—*
Yamauchi, Akira, 3,856,014.

Jirak, Thomas L.: *See—*
Mulier, Pieter M. J.; and Jirak, Thomas L., 3,857,085.

Jiu, James: *See—*
Hsu, Charles F.; Jiu, James; and Mizuba, Seth Setsuo, 3,856,852.

Jobst Institute, Inc.: *See—*
Fowler, Susan M.; Gottfried, Carolyn Jobst; Mosiniak, Dennis G.; and Tenteris, Ansis U., 3,856,098.

Jockers, Kurt: *See—*
Kartte, Klaus; Fuchs, Hugo; Jockers, Kurt; Kahr, Kurt; and Meier, Hermann, 3,856,924.

Johns-Manville Corporation: *See—*
Benner, Stanley G.; and Greene, Kenneth F., 3,856,544.
Cox, Edwin Dexter, 3,856,333.
Rees, Charles E., Jr., 3,856,207.

Johnson & Johnson: *See—*
Krzewinski, Henrietta K., 3,856,006.
Winnie, Alon P., 3,856,009.

Johnson, David F.: *See—*
Callaghan, John W.; and Johnson, David F., 3,856,068.

Johnson, Dennis C.: *See—*
Hahn, Paul B.; Johnson, Dennis C.; Shanks, Howard R.; and Wechter, Margaret A., 3,856,634.

Johnson, Donald R.; and Sawers, James R., Jr., to Du Pont de Nemours, E. I., and Company. Diamond joined to metal. 3,856,480, Cl. 29-195.000.

Johnson, James R. Pipe cutting and beveling tool. 3,856,283, Cl. 266-23.0nn.

Johnson, Kenneth R.; and Lense, Robert F., to Rexham Corporation. Method and machine for forming flat bottom bags having side gussets. 3,855,907, Cl. 93-35.0sb.

Johnson, S. C., & Sons, Inc.: *See—*
Hagarty, John D., 3,856,896.

Johnson, William Peter, 20% to Lee, Raymond, Organization Inc., The. Boot zipper. 3,855,715, Cl. 36-50.000.

Johnsson, Erik Borje, to Aktiebolaget Atomenergi. Locking device for the lid of a pressure vessel. 3,856,338, Cl. 292-256.000.

Johnston, James D.: *See—*
Becker, Warren E.; Johnston, James D.; and Hildreth, Clarence L., 3,856,511.

Johnston, Richard D.: *See—*
Harmon, James F.; Johnston, Richard D.; Lach, John H.; von der Lieth, William H.; and Murphy, Thomas L., 3,855,913.

Johst, Wolfgang: *See—*
Simon, Stefan; Wolff, Justus; and Johst, Wolfgang, 3,856,143.

Jones, David C., to Ford Motor Company. Lead-acid battery test method. 3,857,087, Cl. 324-29.500.

Jones, Jerry O.: *See—*
Parker, Leland L.; Jones, Jerry O.; and Osburn, Michael R., 3,855,932.

Jonsson, Uno I., to Munters, Carl, AB. Method and a device in connection with a regenerative drier for gas under overpressure. 3,855,719, Cl. 34-9.000.

Jordan, Chalmer C. Valve. 3,856,262, Cl. 251-340.000.

Jordan, William E., to Xerox Corporation. Reproduction machine fuser. 3,856,461, Cl. 432-60.000.

Joseloff, Stanley. Automatic bagging device. 3,855,757, Cl. 53-188.000.

Jourdan, Jerry W., to ACF Industries, Incorporated. Pressure relief means for valve body chamber. 3,856,261, Cl. 251-172.000.

Joyce, Jerry R.: *See—*
Smith, Jay G., Jr.; and Joyce, Jerry R., 3,855,760.

Joyce, Ronald W.; and Dozier, Ross T., to Victor Comptometer Corporation. Air gun valve apparatus assembly. 3,855,990, Cl. 124-13.00a.

Jubany, Modesto Lopez. Manufacture of chenille yarn. 3,855,768, Cl. 57-24.000.

Juels, Ronald J., to Comstron Corporation. Compensating techniques for sensitive wide band voltmeters. 3,857,097, Cl. 324-132.000.

Jung, Johann: *See—*
Zeeh, Bernd; Jung, Johann; and Rentzea, Costin, 3,856,501.

Junghans, Gebruder, G.m.b.H., Firma: *See—*
Assmus, Friedrich, 3,855,787.

Kabushiki Kaisha Akashi Seisakusho: *See—*
Shirai, Shogo; and Uchida, Haruo, 3,857,055.

Kabushiki Kaisha Daini Seikosha: *See—*
Yamamoto, Eiji, 3,855,786.

Kabushiki Kaisha Hasegawa Haguruma: *See—*
Honma, Seishi; and Fujii, Yoshihisa, 3,855,874.

Kabushiki Kaisha Ideal: *See—*
Sato, Yoshio, 3,856,030.

Kabushiki Kaisha Machida Seisakusho: *See—*
Chikama, Toshio, 3,856,000.

Kabushiki Kaisha Shimizu Manzo Shoten: *See—*
Sugiyama, Noboru; and Shimahara, Hideo, 3,856,945.

Kabushiki Kaisha Suwa Seikosha: *See—*
Chihara, Hiroyuki; and Ushiyama, Yoshito, 3,855,781.
Nishimura, Izuhiko; and Ogata, Toshiaki, 3,855,782.
Ushikoshi, Kenichi, 3,855,785.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Yoshizawa, Toshio; Yamada, Yasuo; Taniguchi, Toshinori; Kose, Tatsuo; Ohchi, Kazuo; and Hori, Kiyokazu, 3,855,771.

Kabushiki Kaisha Yashica: *See—*
Fujioka, Yoshisato, 3,856,386.

Kabushikikaisha Tokyo Keiki (Tokyo Keiki Co., Ltd.): *See—*
Kawada, Shin-Ichi; and Hojo, Takeshi, 3,855,711.

Kachik, Robert H.: *See—*
Adams, Richard C.; Kachik, Robert H.; Pignocco, Arthur J.; and Rall, Waldo, 3,856,076.

Kaczorowski, Janusz: *See—*
Brzozowski, Zbigniew K.; Porejko, Stanislaw; Kaczorowski, Janusz; and Kielkiewicz, Jedrzej, 3,856,556.

Kadokura, Sadao: *See—*
Kishida, Takashi; and Kadokura, Sadao, 3,855,676.

Kagawa, Ichiro: *See—*
Yamazaki, Shumpei; Kagawa, Ichiro; and Sugimura, Yuriko, 3,856,587.

Kahr, Kurt: *See—*
Kartte, Klaus; Fuchs, Hugo; Jockers, Kurt; Kahr, Kurt; and Meier, Hermann, 3,856,924.

Kaiya, Atsushi: *See—*
Otsuki, Yutaka; Imai, Hirosuke; Kaiya, Atsushi; and Horii, Hideo, 3,856,877.

Kaji, Shigeo: *See—*
Ogawa, Tadaharu; Yasui, Hiroshi; and Kaji, Shigeo, 3,856,505.

Kakimoto, Masakazu. Rotary drive apparatus. 3,855,872, Cl. 74-242.160.

Kakizaki, Tadao; Ichimaru, Yoshiro; and Arai, Ryozo, to Nissan Motor Company, Limited. Motor vehicle odometer system. 3,856,195, Cl. 235-97.000.

Kalifon, Sam, to Continental Copper & Steel Industries, Inc. Apparatus having ultrasonic transducer for detecting cable dielectric faults. 3,857,091, Cl. 324-52.000.

Kalle Aktiengesellschaft: *See—*
Schadlich, Gunther; Haenisch, Renate; and Moraw, Roland, 3,856,529.

Kalman, Peter Gabor. Filtering process and apparatus. 3,856,674, Cl. 210-71.000.

Kalopissis, Gregoire; and Bugaut, Andree, to Societe Anonyme dite: L'Oreal. 4-Hydroxy-7-methyl benzimidazole. 3,856,810, Cl. 260-309.200.

Kaltenbach, Robert Paul; and Rogers, Wayne C., to Riley Stoker Corporation. Material pulverizing system. 3,856,214, Cl. 241-34.000.

Kaman Aerospace Corporation: *See—*
Flannelly, William G., 3,856,267.

Kamo, Yasuo, to Hitachi, Ltd. Fuel assembly for nuclear reactor. 3,856,623, Cl. 176-78.000.

Kanamaru, Toshiji: *See—*
Uchida, Kosaku; Ide, Susumu; Kanamaru, Toshiji; and Kitamura, Sadafumi, 3,855,962.
Uchida, Kosaku; Ide, Susumu; Kanamaru, Toshiji; and Kitamura, Sadafumi, 3,855,964.

Kanemoto, Kazuo: *See—*
Takahashi, Reijiro; Kanemoto, Kazuo; and Ito, Toshikatu, 3,855,836.

Kannegisser, Herbert, Kommanditgesellschaft: *See—*
Holzinger, Karl, 3,856,451.

Kanow, Willy, to Loewe-Opta GmbH. Frequency drift compensation for a voltage controlled oscillator. 3,857,108, Cl. 331-14.000.

Kaolin Corporation: *See—*
DuLaney, Lucius B.; and Theobold, Erwin F., 3,856,213.

Karcher, Thomas D.; and Antoniw, Walter W., to Hansen Manufacturing Company, The. Coupling assembly. 3,856,336, Cl. 285-316.000.

Karkoska, George E., to G. E. K. Enterprises, Inc. Football goal posts. 3,856,302, Cl. 273-55.00r.

Kartte, Klaus; Fuchs, Hugo; Jockers, Kurt; Kahr, Kurt; and Meier, Hermann, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of hydroxylammonium nitrate. 3,856,924, Cl. 423-387.000.

Kashio, Toshio, to Casio Computer Co., Ltd. Electronic clock device. 3,855,780, Cl. 58-4.00a.

Kasmer, Thomas E., to Magnetic Laboratories, Inc. Speed and direction control apparatus for DC motors. 3,857,077, Cl. 318-257.000.

Kasselmann, John T., to Bendix Corporation, The. Adjustable linkage for transmitting the output from a sensor to a control valve. 3,856,363, Cl. 303-7.000.

Kast, Howard B.: *See—*
Genever-Watling, David C.; and Kast, Howard B., 3,856,201.

Kathawala, Faizulla G., to Sandoz-Wander, Inc. S-Triazolo (4,3-d) (1,4) benzothiazepin-3 (2H)-one-7,7-dioxides. 3,856,808, Cl. 260-308.00c.

Kato, Satoru; Fukuda, Kouki; and Nannichi, Kuninobu, to Mitsubishi Denki Kabushiki Kaisha. Electric vacuum cleaner. 3,856,488, Cl. 55-300.000.

Kato, Tadanari; Ikemi, Tadashi; Ooishi, Tutomu; Sano, Mitsuyoshi; Hayashida, Kengo; and Matsumoto, Chinami, to Nissan Motor Company, Limited. Method for preparing a monolithic catalyst containing a sol and the catalyst obtained therefrom. 3,856,707, Cl. 25-455.00r.

Kato, Takashi: *See—*
Mori, Kenjiro; Ikebe, Shigueaqui; Hirooka, Masaaki; and Kato, Takashi, 3,856,685.

Katzberg, Stephen J.: *See—*
Sinclair, Archibald R.; Burcher, Ernest E.; and Katzberg, Stephen J., 3,857,031.

Kaufman, Bruce L., to International Telephone and Telegraph Corporation, mesne. Wedge anchor. 3,855,896, Cl. 85-78.000.

Kavesh, Sheldon, to Allied Chemical Corporation. Method of centrifugal production of continuous metal filaments. 3,856,074, Cl. 164-87.000.

Kavthekar, Keshav S.; and Clemett, Edwin F., Jr., to McCord Corporation. Liquid level sensor. 3,857,004, Cl. 200-84.00c.

Kawada, Shin-Ichi; and Hojo, Takeshi, to Kabushikikaisha Tokyo Keiki (Tokyo Keiki Co., Ltd.). Gyrocompass. 3,855,711, Cl. 33-327.000.

Kawano, Susumu, to Amada Company Limited. Material support apparatus for a press brake system. 3,855,840, Cl. 72-418.000.

Kawasaki, Harumi: *See—*
Takeda, Hideomi; and Kawasaki, Harumi, 3,856,407.

Kayser, Detlev: *See—*
Dahm, Johann; Borck, Joachim; Nowak, Herbert; Simane, Zdenek; and Kayser, Detlev, 3,856,812.

KCA Laser Systems: *See—*
Cindrich, Ivan; Aleksoff, Carl C.; and Klooster, Alex, Jr., 3,856,409.

Kearney & Trecker Corporation: *See—*
Zankl, Frank, 3,856,114.

Keblys, Kestutis A., to Ethyl Corporation. Process for recovering cobalt catalyst in an active form from a hydroesterification reaction mixture. 3,856,832, Cl. 260-410.90r.

Keene, Wayne H.: *See—*
United States of America, National Aeronautics and Space Administration, 3,856,402.

Kehler, Gordon W. Mower cleaning apparatus. 3,856,028, Cl. 134-198.000.

Keighley, Neville, to D.T. & N. Keighley (Whalley) Limited. Fastening means. 3,856,247, Cl. 248-154.000.

Keijser, Carl, & Co., AB: *See—*
Engvall, Erik Arne; and Ritscher, Thomas, 3,856,113.

Keil, Werner: *See—*
Rothmann, Hans; and Keil, Werner, 3,856,641.

Keller, Theodore E., to Union Oil Company of California. Method for determining fluid saturations in petroleum reservoirs. 3,856,468, Cl. 23-230.0ep.

Kellwood Company: *See—*
Pohl, Harold J., 3,856,191.

Kelly, Franklin. Blister packaging assembly. 3,856,144, Cl. 206-462.000.

Kelly, James M. Pantographic cargo hoist. 3,856,342, Cl. 294-67.00r.

Kelly, William John: *See—*
Fothergill, Bernard Henry; Earle, Henry; and Kelly, William John, 3,856,269.

Kemp, John Edward Glyn: *See—*
Danilewicz, John Christopher; Kemp, John Edward Glyn; Snarey, Michael; and Wright, James Robert, 3,856,794.

Kendall, Wyvil R., to General Electric Company. Nuclear fuel rod bundle handling means useful in an irradiated fuel reprocessing system. 3,855,684, Cl. 29-200.00d.

Kennedy, James S.: *See—*
West, Charles M.; Graham, Glen H.; and Kennedy, James S., 3,856,891.

Kennedy, Joseph P.: *See—*
Thaler, Warren A.; Buckley, Donald J., Sr.; and Kennedy, Joseph P., 3,856,763.

Kenney, Harold E.; and Donahue, Edward T., to United States of America, Agriculture. Ether-containing dibasic fatty acid metal soap thickened greases. 3,856,688, Cl. 252-39.000.

Kenney, Ralph L.: *See—*
United States of America, National Aeronautics and Space Administration, 3,855,873.

Kenny, Andrew Augustine; Larson, Richard Kendall; and Janous, Donald Frank, to Eaton Corporation. Vacuum control valve. 3,856,045, Cl. 137-625.110.

Kerr-McGee Chemical Corporation: *See—*
Prieto, Martin Angel, 3,856,576.

Kessler, Milton. Snap-top bottle cap with safety pry-off. 3,856,170, Cl. 215-224.000.

Kessler, Richard B.; and Nobel, Fred I., to Lea-Ronal, Inc. Methods of electroplating zinc and cyanide free or low cyanide zinc plating baths therefor. 3,856,637, Cl. 204-29.000.

Keuffel & Esser Company: *See—*
Levinos, Steven, 3,856,528.

Khotina, Alexandra Vasilievna: *See—*
Prudkovsky, Garald Petrovich; Khotina, Alexandra Vasilievna; Sushkin, Nikolai Gavrilovich; Kopnev, Lev Nikolaevich; and Merzlikin, Sergei Filippovich, 3,857,014.

Kibushiki Kaisha Suwa Seikosha: *See—*
Oki, Toshihiko; Kurita, Hirohisa; and Fujimori, Motoyuki, 3,856,577.

Kielkiewicz, Jedrzej: *See—*
Brzozowski, Zbigniew K.; Porejko, Stanislaw; Kaczorowski, Janusz; and Kielkiewicz, Jedrzej, 3,856,556.

Kiesheyer, Heinrich: *See—*
Brandis, Helmut; Oppenheim, Rudolf; Lennartz, Gustav; and Kiesheyer, Heinrich, 3,856,515.

Kikuno, Hideo: *See—*
Sakurai, Masayuki; Takahashi, Syozo; and Kikuno, Hideo, 3,856,132.

Kilkes, Robert J., to Xerox Corporation. Indicating and switching apparatus. 3,856,997, Cl. 200-5.00r.

Kim, He B.; and Driver, Michael C., to Westinghouse Electric Corporation. Application of facet-growth to self-aligned schottky barrier gate filed effect transistors. 3,855,690, Cl. 29-571.000.

Kim, Tai K.: *See—*
Pagnozzi, L. Rita; Kim, Tai K.; Laferty, John M.; and MacInnis, Martin B., 3,856,915.

Kim, You Song, to Bell Telephone Laboratories, Incorporated. Method for producing lead zirconate titanate polycrystalline ceramics. 3,856,693, Cl. 252-62.900.

Kimura, Makoto: *See—*
Iijima, Akira; Yokoyama, Yujiro; Yamada, Yosuke; and Kimura, Makoto, 3,856,448.

Kimura, Shunichiro: *See—*
Hosono, Hiroo; Minamide, Seiko; Hukushima, Juichi; Kudou, Yoku; and Kimura, Shunichiro, 3,856,228.

Kimura, Terutoshi: *See—*
Sakakibara, Shunpei; Kumahara, Yuichi; and Kimura, Terutoshi, 3,856,769.

Kincaid, John F.; Hammett, Louis P.; and Dailey, Benjamin P., to United States of America, Scientific Research and Development. Propellants and method of producing the same. 3,856,590, Cl. 149-19.800.

Kinell, Donald K.: *See—*
Unites States of America, National Aeronautics and Space Administration, 3,857,045.

King, Christopher John Hall: *See—*
Fleischmann, Martin; King, Christopher John Hall; Oldfield, John Wilfred; Plimley, Raymond Ernest; and Tennakoon, Charles Lionel Kasturiratne, 3,856,652.

King Radio Corporation: *See—*
Van Englehoven, Clarence, 3,857,032.

Kinney, Layton C.; and Tompkins, Edwin H., to American Screen Process Equipment Company, mesne. Method and apparatus for printing. 3,855,928, Cl. 101-471.000.

Kinsey, Lewis R. Handlebar-mounted clutch actuating and gear shifting device for motorcycles. 3,856,123, Cl. 192-3.620.

Kinyo-Sha Co., Ltd.: *See—*
Maeda, Moriichi; Onuki, Akio; and Kusano, Kazuya, 3,856,914.

Kiritani, Masataka: *See—*
Hayashi, Takao; Matsukawa, Hiroharu; and Kiritani, Masataka, 3,856,553.

Kirkham, William Brian, to Domtar Limited. Paper coated with clay and asbestos. 3,856,564, Cl. 117-155.0ua.

Kirkland, Kenneth C., Jr.; and Hunt, Raymon E., to Garlock, Inc., mesne. Method and apparatus for controlling vehicle noise. 3,856,991, Cl. 179-1.00p.

Kirkpatrick, Harold B., to Reichhold Chemicals, Inc. Molding process for foamed articles using an expandable mold with inner and outer restraints. 3,856,902, Cl. 264-45.200.

Kirst, Rudi, to Hofmann & Co. KG. Cylinder piston unit for a power operated revolving chuck. 3,855,902, Cl. 91-420.000.

Kishi, Tuneo: *See—*
Daimon, Goro; Nakano, Seizo; and Kishi, Tuneo, 3,857,006.

Kishida, Takashi; and Kadokura, Sadao, to Teijin Limited. Apparatus for drawing, separating and winding filament. 3,855,676, Cl. 28-71.300.

Kishimoto, Hiroyuki; and Morozumi, Eiichi, to Honeywell Inc. Temperature sensing apparatus having a gas adsorbing element contained in the sensing bulb. 3,855,865, Cl. 73-368.200.

Kitamura, Sadafumi: *See—*
Uchida, Kosaku; Ide, Susumu; Kanamaru, Toshiji; and Kitamura, Sadafumi, 3,855,962.
Uchida, Kosaku; Ide, Susumu; Kanamaru, Toshiji; and Kitamura, Sadafumi, 3,855,964.

Kitano, Ichiro; and Ikeda, Yoshiro, to Nippon Selfoc Kabushiki Kaisha; a/k/a Nippon Selfoc Co., Ltd. Light-conducting glass structures made by vaporization. 3,856,494, Cl. 65-2.000.

Kitanosono, Hidehiro; Kubo, Takeaki; and Shida, Shigeru, to Hitachi Ltd. Method and apparatus for controlling plate thickness in a rolling mill. 3,855,830, Cl. 72-8.000.

Klass, Donald L., to Institute of Gas Technology, The. Hydrate forming in water desalination. 3,856,492, Cl. 62-58.000.

Kleine, Richard A.: *See—*
Rohn, Ivan D.; Kleine, Richard A.; and Wright, Charles A., 3,856,639.

Kligman, Albert Montgomery. Skin depigmentation. 3,856,934, Cl. 424-62.000.

Klinger, Josef F.; and Terrill, John Mark, to Termex, Inc. Thermometer readout means. 3,855,866, Cl. 73-372.000.

Klooster, Alex, Jr.: *See—*
Cindrich, Ivan; Aleksoff, Carl C.; and Klooster, Alex, Jr., 3,856,409.

Kloss, Wilfred: *See—*
Eggensperger, Heinz; Franzen, Volker; Diehl, Karl-Heinz; and Kloss, Wilfred, 3,856,846.

Klug, Helmut; and Mukerjee, Ambar Nath, to Hoechst Aktiengesellschaft. Process for the manufacture of a light colored thermostable chlorinated polyolefin. 3,856,766, Cl. 260-88.200.

Knell, Martin: *See—*
Dexter, Martin; and Knell, Martin, 3,856,748.

Knight, Mark Berwyn, to RCA Corporation. Detector employing a current mirror. 3,857,047, Cl. 307-231.000.

Knize, James J.: *See—*
Bayne, Justin A.; and Knize, James J., 3,856,196.

Knohl, Friedrich Karl, to Illinois Tool Works Inc. Stapling method. 3,855,688, Cl. 29-432.000.

Knoll International, Inc.: *See—*
Morrison, Andrew I.; and Hannah, Bruce R., 3,856,353.

Kobale, Manfred: *See—*
Heywang, Hermann; Kobale, Manfred; Preissinger, Karl-Heinz; Ristow, Dietrich; and Wehnelt, Ulrich, 3,857,074.

Kobayakawa, Toshihiro: *See—*
Arimura, Katsuo; Kobayakawa, Toshihiro; Ao, Hideki; and Tsuda, Yoshiaki, 3,856,797.

Kobayashi, Hisamine, to Shikishima Tipton Mfg., Co., Ltd. Centrifugal barrel finishing apparatus having tiltable tubs. 3,855,740, Cl. 51-164.000.

Kobayashi, Juichi: *See—*
Nakamoto, Hideo; Kobayashi, Juichi; and Kobayashi, Takashi, 3,856,643.

Kobayashi, Kazuhiko: *See—*
Saito, Nagao; Kobayashi, Kazuhiko; and Tomimoto, Naokazu, 3,857,011.

Kobayashi, Shoichi: *See—*
Ueshima, Takashi; Kobayashi, Shoichi; and Matsuoka, Masami, 3,856,758.

Kobayashi, Takashi: *See—*
Nakamoto, Hideo; Kobayashi, Juichi; and Kobayashi, Takashi, 3,856,643.

Koch, Edgar F.: *See—*
United States of America, National Aeronautics and Space Administration, 3,856,042.

Kock, Theodorus Joannes: *See—*
Muller, Johannes Jacobus; and Kock, Theodorus Joannes, 3,856,703.

Kodera, Yoshihide; Todo, Naoyuki; and Fukuda, Kenzo, to Agency of Industrial Science & Technology. Method for manufacture of hydrogen and carbonyl sulfide from hydrogen sulfide and carbon monoxide. 3,856,925, Cl. 423-416.000.

Koehler-Dayton, Inc.: *See—*
Foster, George W.; and Campbell, Alexander J., 3,855,641.

Kohase, Shigeru: *See—*
Kolshi, Hitoshi; Takao, Michio; Oda, Yasuhiro; Iguchi, Hideo; and Kohase, Shigeru, 3,856,759.

Kohl, Karl. Arrangement for the manufacture of velour. 3,855,820, Cl. 66-87.000.

Kohmoto, Keisuke; and Miyazaki, Koshin, to Nippon Soda Company, Limited. Metal salts of bis-thioureido benzenes. 3,856,847, Cl. 260-470.000.

Koike, Norio: *See—*
Yamaura, Tokuharu; Takeda, Masayuki; Tajima, Koi; and Koike, Norio, 3,856,926.

Koivunen, Erkki A.: *See—*
Green, Raymond J.; and Koivunen, Erkki A., 3,855,987.

Koizumi, Toshihiro, to Nissan Motor Company, Limited. Safety harness shock absorber. 3,856,328, Cl. 280-150.0sb.

Kokusan Denki Co., Ltd.: *See—*
Shirai, Kiyoshi, 3,855,985.

Kolshi, Hitoshi; Takao, Michio; Oda, Yasuhiro; Iguchi, Hideo; and Kohase, Shigeru, to Tokyo Printing Ink Mfg. Co., Ltd. Vehicles for printing ink. 3,856,759, Cl. 260-78.40d.

Komlos, Anna, nee Kiss: *See—*
Rakoczi, Jozsef; Beck, Ivan; Komlos, Endre; Petocz, Lujza; and Grasser, Katalin, 3,856,778.

Komlos, Endre: *See—*
Rakoczi, Jozsef; Beck, Ivan; Komlos, Endre; Petocz, Lujza; and Grasser, Katalin, 3,856,778.

Komura, Hajime: *See—*
Ishido, Yoshiharu; Yoshino, Teruo; Komura, Hajime; Suzuki, Katsumi; Yamasaki, Akihiro; and Okutsu, Masaru, 3,856,777.

Kondo, Asaji: *See—*
Miyano, Shizuo; and Kondo, Asaji, 3,856,699.

Kono, Hisashi: *See—*
Suzukawa, Yuichi; Kono, Hisashi; and Kuribayashi, Atushi, 3,856,441.

Konttorikoneteollisuus Oy: *See—*
Lukkarinen, Erkki, 3,856,604.

Kopnev, Lev Nikolaevich: *See—*
Prudkovsky, Garald Petrovich; Khotina, Alexandra Vasilievna; Sushkin, Nikolai Gavrilovich; Kopnev, Lev Nikolaevich; and Merzlikin, Sergei Filippovich, 3,857,014.

Kosaka, Takeshi, to Minolta Camera Kabushiki Kaisha. Method for computing main, flash and bump exposures for direct screening. 3,857,024, Cl. 235-151.300.

Kose, Tatsuo: *See—*
Yoshizawa, Toshio; Yamada, Yasuo; Taniguchi, Toshinori; Kose, Tatsuo; Ohchi, Kazuo; and Hori, Kiyokazu, 3,855,771.

Kosikawa, Kiyoshi: *See—*
Susuki, Rinnosuke; Hoshi, Hiroshi; Satto, Jiro; Takano, Koichi; and Kosikawa, Kiyoshi, 3,856,614.

Kovac, Stephen Robert. Trocar-catheter assembly. 3,856,020, Cl. 128-347.000.

Krammer, Robert: *See—*
Krammer, Robert, 3,856,134.

Krammer, Robert, 1/3 to Bildsoe, Jorgen S., mesne, 1/3 to Krammer, Robert and 1/3 to Brookfield, Myron B. Conveyor chain. 3,856,134, Cl. 198-189.000.

Kraus, Alfred P.; Kraus, Lorraine M.; and Wood, John L., to University of Tennessee Research Corporation, The. Protein molecular prosthesis mediated by carbamyl phosphate and carbamyl phosphate derivations. 3,856,624, Cl. 195-1.800.

Kraus, Lorraine M.: *See—*
Kraus, Alfred P.; Kraus, Lorraine M.; and Wood, John L., 3,856,624.

Krekeler, Claude B., to Cincinnati Mine Machinery Co., The. Wear-resistant inserts for in surfaces of the links of cutter chains and the like to retard wear thereof. 3,856,358, Cl. 299-82.000.

Krekeler, Claude B., to Cincinnati Mine Machinery Co., The. Anti-coring device for use with bit mounting means on mining, earthworking and digging machines. 3,856,359, Cl. 299-92.000.

Krembel, Frank, Jr., to Columbia Marking Tools, Inc. Combination of apparatus and buffer structure. 3,855,922, Cl. 101-3.00r.

Krinke, Harlan L., to Minnesota Mining and Manufacturing Company. Illuminating device. 3,857,029, Cl. 240-41.300.

Krishnan, Kamala S., to United States of America, Navy. Prism to separate a second harmonic from its fundamental frequency. 3,856,380, Cl. 350-157.000.

Kristiansen, Odd; and Gubler, Kurt, to Ciba-Geigy Corporation. Insecticidal phosphoric acid esters. 3,856,948, Cl. 424-212.000.

Krupick, Walter J.: *See—*
Weisbord, Leon; and Krupick, Walter J., 3,856,366.

Kruse, Joachim: *See—*
Elm, Karl Horst; Schatton, Paul; and Kruse, Joachim, 3,856,337.

Kryzhanovsky, Iosif Ivanovich. Optical mirror. 3,856,384, Cl. 350-310.000.

Krzewinski, Henrietta K., to Johnson & Johnson. Surgical drapes with improved arm coverage. 3,856,006, Cl. 128-132.00d.

Kubo, Takeaki: *See—*
Kitanosono, Hidehiro; Kubo, Takeaki; and Shida, Shigeru, 3,855,830.

Kuchuris, George F.: *See—*
Yatsushiro, Kenji; and Kuchuris, George F., 3,857,053.

Kudou, Yoku: *See—*
Hosono, Hiroo; Minamide, Seiko; Hukushima, Juichi; Kudou, Yoku; and Kimura, Shunichiro, 3,856,228.

Kuehn, Erich, to Atlas Chemical Industries, Inc. Polymerizable urethane compounds. 3,856,830, Cl. 260-404.00s.

Kuehn, Howard E.: *See—*
Andriola, Achilles D.; Kuehn, Howard E.; Whittum, Warren C.; and Wink, Donald E., 3,855,681.

Kuehn, Lorne A.; and McHattie, Lloyd E., to Canada, Her Majesty the Queen in the right of, as represented by the Minister of National Defence. Method and apparatus for determining wet bulb globe temperature. 3,855,863, Cl. 73-339.00c.

Kugler, Tibor; and Rieger, Hans Wolfhart, to Swiss Aluminium Ltd. Cathode for an aluminium fusion electrolysis cell and method of making the same. 3,856,650, Cl. 204-243.00r.

Kuhla, Donald E.; Sarges, Reinhard; and Wiedermann, Hans E., to Pfizer Inc. Thiazolecarboxamide sulfonylurea hypoglycemic agents. 3,856,806, Cl. 260-302.00r.

Kuhnle, Ernst, to Bizerba-Werke Wilhelm Kraut KG. Spring balance apparatus provided with compensation for measuring error due to temperature changes. 3,856,098, Cl. 177-227.000.

Kulo Herman & Modell: *See—*
Herman, Marvin J., 3,856,346.

Kumahara, Yuichi: *See—*
Sakakibara, Shunpei; Kumahara, Yuichi; and Kimura, Terutoshi, 3,856,769.

Kumano, Hiroshi: *See—*
Nishino, Atsushi; Kumano, Hiroshi; and Iura, Yukihide, 3,855,914.

Kupperman, Dennis I.: *See—*
Kupperman, Sam; and Kupperman, Dennis I., 3,856,241.

Kupperman, Sam; and Kupperman, Dennis I., to RB Toy Development Co. Knockdown kite. 3,856,241, Cl. 244-154.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Amagi, Yasuo; and Skiiki, Zenya, 3,856,574.

Kuribayashi, Atushi: *See—*
Suzukawa, Yuichi; Kono, Hisashi; and Kuribayashi, Atushi, 3,856,441.

Kurita, Hirohisa: *See—*
Oki, Toshihiko; Kurita, Hirohisa; and Fujimori, Motoyuki, 3,856,577.

Kusano, Kazuya: *See—*
Maeda, Moriichi; Onuki, Akio; and Kusano, Kazuya, 3,856,914.

Kushida, Masagoro: *See—*
Yamashita, Makoto; Ikura, Kenkichi; and Kushida, Masagoro, 3,856,383.

Kushima, Teizo; Tanaka, Susumu; and Ogawa, Masaya, to Minolta Camera Kabushiki Kaisha. Electronic photocopying machine. 3,856,396, Cl. 355-10.000.

Kusunose, Tetsuhiro: *See—*
Omura, Etuzou; Minami, Toshio; and Kusunose, Tetsuhiro, 3,855,776.

Kuwabara, Nobuaki: *See—*
Sato, Wasuke; Yamamoto, Seijiro; Kuwabara, Nobuaki; and Adachi, Shigeru, 3,856,025.

Kuzuoka, Takeshi: *See—*
Imabori, Junpei; Kuzuoka, Takeshi; and Mori, Atsuhiko, 3,855,842.

Kwolek, John P.; and Thesier, Patrick A., to Bendix Corporation. The. Disc brake with semi-metallic and organic friction pads. 3,856,120, Cl. 188-251.00a.

La Costa, Nicholas J.: *See—*
Barr, Irwin R.; and La Costa, Nicholas J., 3,855,900.

La Fortune, Robert, to Diamond Shamrock Corporation. Degassing of brine. 3,856,482, Cl. 55-36.000.

Labelle, Donald J. Appliance leveling device. 3,856,248, Cl. 248-188.200.

Laboratories du Dr. Debat: *See—*
Debat, Jacques, 3,856,946.

Lach, John H.: *See—*
Harmon, James F.; Johnston, Richard D.; Lach, John H.; von der Lieth, William H.; and Murphy, Thomas L., 3,855,913.

Lacroix, Roger, to Sea Tank Co. Method of submerging a hollow structure. 3,855,803, Cl. 61-46.500.

Laferty, John M.: *See—*
Pagnozzi, L. Rita; Kim, Tai K.; Laferty, John M.; and MacInnis, Martin B., 3,856,915.

Lagrange, Don E.; Davis, Edward J.; Scheer, Eugene R.; Brewer, Ralph E.; and Hamilton, Curtis A., to United States of America, Navy. Laser seeker test set. 3,857,042, Cl. 250-495.000.

Lambert, Robert R., to Air Factors, Inc. Mounting arrangement for air diffuser in a kerfed ceiling. 3,855,909, Cl. 98-40.00d.

Lamberti, John J. Rigid reamer type smoking pipe cleaner. 3,856,024, Cl. 131-243.000.

Lambou, Madeline G.; and Spadaro, James J., to United States of America, Agriculture. Precursor compositions from animal hide glues for dry-structured foams. 3,856,700, Cl. 252-354.000.

Lamer, Gerald P., to Case, J. I., Company. Telescopic boom and jib assembly with means to maintain a predetermined angular position therebetween. 3,856,151, Cl. 212-55.000.

Landrum, Aubrey O.: *See—*
Peters, Beldon A.; Smith, Louis P.; and Landrum, Aubrey O., 3,856,677.

Lane, George A.: *See—*
Jankowiak, Erwin M.; Niles, Earl Thomas; and Lane, George A., 3,856,933.

Laney, Bill C.: *See—*
Grable, Donovan B., 3,855,807.
Grable, Donovan B., 3,856,355.

Langan, Maurice W., to American Colloid Company. Deck construction. 3,855,747, Cl. 52-404.000.

Lange, Hermann Paul. Apparatus for attaching a hot and cold water plumbing fixture to building water pipes. 3,856,334, Cl. 285-137.00r.

Lange, Michael: *See—*
Corte, Herbert; Heller, Harold; Lange, Michael; and Netz, Otto, 3,856,715.

Langham, Stephen, to General Motors Corporation. Diffuser with boundary layer removal. 3,856,430, Cl. 415-207.000.

Laporte Industries Limited: *See—*
Jenkins, Victor Frederick; and Doherty, Daniel Anthony, 3,856,716.

Lappi, Larry R.: *See—*
Moore, George G. I.; and Lappi, Larry R., 3,856,859.

Larkin, Sam. Spring assemblies and bedspring made therefrom and methods of making the same. 3,855,651, Cl. 5-248.000.

Larkin, Sam. Apparatus for preventing displacement of molds. 3,856,075, Cl. 164-323.000.

Larsen, Robert R.: *See—*
Sobey, Albert J.; McQueen, Norman; and Larsen, Robert R., 3,856,106.

Larsen's Manufacturing Company: *See—*
Fudge, William L., 3,856,177.

Larson, Charles O., to Larson, Chas. O., Co. Display rack construction. 3,855,943, Cl. 108-28.000.

Larson, Chas. O., Co.: *See—*
Larson, Charles O., 3,855,943.

Larson, Dennis H.: *See—*
Nesbitt, John D.; Larson, Dennis H.; and Fejer, Mark E., 3,856,496.

Larson, Lester L., to Tektronix, Inc. Oscilloscope sweep system with two sweep generators having speed rate switches and sweep mode switches operated by a control knob. 3,857,059, Cl. 315-391.000.

Larson, Richard Kendall: *See—*
Kenny, Andrew Augustine; Larson, Richard Kendall; and Janous, Donald Frank, 3,856,045.

Laskey, Daniel A.: *See—*
Stumpf, Howard C.; and Laskey, Daniel A., 3,855,883.

Last, Anthony Graham Marshall: *See—*
Gallagher, Brendan; and Last, Anthony Graham Marshall, 3,856,442.

Lawrence, John P.: *See—*
Hopper, Roger J.; and Lawrence, John P., 3,856,762.

Lawson, Anthony Newton; and Tabalba, Camilo Manasala, to International Standard Electric Corporation. Telephone dialing arrangement. 3,856,982, Cl. 179-90.00r.

Lay, Robert; and Haller, Clayton L., to Westinghouse Electric Corporation. Safety mechanism for laundry appliances with door latch for actuating main switch. 3,857,002, Cl. 200-61.640.

Lazarus, Martin, to United States of America, Army. Method for color temperature calibration of tungsten. 3,856,405, Cl. 356-46.000.

Lazzarini, Henri: *See—*
Flamand, Guy; and Lazzarini, Henri, 3,856,131.

Lazzarini, Louis P. Dry peeling apparatus. 3,855,916, Cl. 99-625.000.

Le Clair, Joseph A. R. Orthodontic appliance. 3,855,701, Cl. 32-14.00a.

Le Douarec, Jean-Claude: *See—*
Beregi, Laszlo; Hugon, Pierre; and Le Douarec, Jean-Claude, 3,856,857.

Le Therisien, Louis G., to Subsea Equipment Associates Limited. Apparatus for installing and maintaining subaquatic petrol tanks. 3,855,806, Cl. 61-69.000.

Lea-Ronal, Inc.: *See—*
Kessler, Richard B.; and Nobel, Fred I., 3,856,637.

Leben Utility Co. Ltd.: *See—*
Furuya, Akio; and Ishimaru, Yukihiko, 3,856,885.

Lectron Products Inc.: *See—*
Quantz, Norman G., 3,857,001.

Lee, Billy M., to Burlington Industries, Inc. Circular knitting machine takeup with a slitting device. 3,855,822, Cl. 66-147.000.

Lee, Cheuk Man, to Abbott Laboratories. 1-(5-Phenyl-4-oxo-2-oxazolin-2-yl)-4-cinnamoylpiperazines in the treatment of depression. 3,856,958, Cl. 424-250.000.

Lee, Haju; and Rosen, Harvey Milton, to Grace, W. R., & Co. Closed-loop ozone generating and contacting system. 3,856,671, Cl. 210-63.000.

Lee, Raymond, Organization Inc., The: *See—*
Johnson, William Peter, 3,855,715.
Matsumoto, Josie, 3,856,002.
Senkyrik, Frank, 3,855,831.

Leek, Wayne E.: *See—*
English, Myrle H.; Goodstal, Laurence; Leek, Wayne E.; Sanzo, Robert J.; Turner, Robert L.; Workman, Clark B.; and Yetter, Edward W., 3,857,025.

Leesona Corporation: *See—*
Morton, Robert Earl, 3,855,769.

Lefrancois, Robert; Denoyers, Jacques; and Gabriel, Michel, to Societe Anonyme: Produits Chimiques Ugine Kuhlmann. Process for preparing chromium sulphate from residual solutions containing hexavalent chromium compounds. 3,856,916, Cl. 423-54.000.

Legere, Allan E., to Cesari and McKenna. Hair grooming aid. 3,856,027, Cl. 132-148.000.

Leggiere, Robert. Multi-purpose trim for door and window frames. 3,855,746, Cl. 52-213.000.

Lehberger, Erich: *See—*
Fromme, Hans-Georg; and Lehberger, Erich, 3,855,941.

Lehmann, Willi; and Wachtel, Anselm, to Westinghouse Electric Corporation. Discharge device and method for generating near infrared radiations. 3,857,054, Cl. 313-486.000.

Leibach, Heinrich, to Motoren- und Turbinen-Union Munchen GmbH. Apparatus for thrust reversal. 3,856,239, Cl. 244-12.00d.

Leichliter, Wayne K., to Eaton Corporation. Viscous coupling. 3,856,122, Cl. 192-58.00b.

Leigh, Roland Albert: *See—*
Stanbank, Derek James; Leigh, Roland Albert; and Gibson, Geoffrey Moorhouse, 3,856,696.

Leight, Howard S. Ear protector assembly. 3,856,007, Cl. 128-152.000.

Leitnaker, James M.: *See—*
Pollock, Charles B.; Scott, James L.; and Leitnaker, James M., 3,856,622.

Leitz, Ernst GmbH: *See—*
Hartmann, Horst; and Stankewitz, Hans-Werner, 3,856,400.
Heitmann, Knut; and Schneider, Eckart, 3,856,401.
Schmidt, Ewald; and Wiessner, Willi, 3,856,416.

Lennartsson, Mats: *See—*
Hill, Jan Erik; Eriksson, Erik Lennart; and Lennartsson, Mats, 3,856,408.

Lennartz, Gustav: *See—*
Brandis, Helmut; Oppenheim, Rudolf; Lennartz, Gustav; and Kiesheyer, Heinrich, 3,856,515.

Lense, Robert F.: *See—*
Johnson, Kenneth R.; and Lense, Robert F., 3,855,907.

Leonard, Gordon Harris; and Ramshaw, Anthony John, to C.A.V. Limited. Flashing lamp circuits. 3,857,062, Cl. 315-136.000.

Leone International Sales Corporation, mesne: *See—*
Nesbitt, John D.; Larson, Dennis H.; and Fejer, Mark E., 3,856,496.

Leo's Quality Foods: *See—*
Wiley, Ron; and Searing, Harvey R., 3,855,889.
Les Aplications Industrielles du Tube: *See—*
Regis, Rene Marc Jean, 3,856,252.
Leschek, Walter C., to Westinghouse Electric Corporation. Acoustic emission transducer and monitoring system. 3,855,847, Cl. 73-71.400.
Leschonski, Kurt P.: *See—*
Rumpf, Hans; Leschonski, Kurt P.; and Schubert, Helmar, 3,856,483.
Leslie Co.: *See—*
Scull, William L., 3,856,049.
Letawa, John R.: *See—*
Campagna, Edward R.; Hardy, Donald F.; Palmer, Thomas W., III; Daugherty, Barney R.; and Letawa, John R., 3,856,498.
Leuenberger, Gottfried, to Leuenberger, Peter. Electric switch. 3,857,007, Cl. 200-153.00h.
Leuenberger, Peter: *See—*
Leuenberger, Gottfried, 3,857,007.
Lever Brothers Company: *See—*
Muller, Johannes Jacobus; and Kock, Theodorus Joannes, 3,856,703.
Levine, Ira A. Light metering and controlling device. 3,856,418, Cl. 356-233.000.
Levine, Ira A. Non-overlapping coating device. 3,856,419, Cl. 401-5.000.
Levine, Irving. Hanging merchandise display and containing apparatus. 3,856,146, Cl. 211-134.000.
Levine, Seymour D.: *See—*
Stiller, Eric T.; Levine, Seymour D.; Principe, Pacifico A.; and Diassi, Patrick A., 3,856,977.
Levinos, Steven, to Keuffel & Esser Company. Color toned photopolymerization imaging process. 3,856,528, Cl. 96-49.000.
Leviton Manufacturing Co., Inc.: *See—*
Poliak, John M.; Weitzman, Milton J.; and Lopez, Juan M., 3,856,376.
Lewis, J. Stephen: *See—*
Sapkus, Jurgis; Lewis, J. Stephen; Vowles, Colin; and Yarbrough, William R., 3,855,729.
Lewis, Richard L.; and Hickner, George B. Vehicle brake system having foot pedal operated brake actuator with electronic range control. 3,856,105, Cl. 180-98.000.
Ley, Kurt: *See—*
Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,856,957.
Licentia Patent-Verwaltungs-GmbH: *See—*
Borchert, Edgar; and Sommer, Karl-Heinz, 3,856,586.
Lidkopings Mekaniska Verkstads Aktiebolag: *See—*
Nordin, Karl Tore, 3,855,992.
Lieb, Donald F.; and Stillman, Neil W., to Diamond Shamrock Corporation. Method for electrosanitizing waste water. 3,856,642, Cl. 204-149.000.
Lieb, Helmut, to Maschinenfabrik Augsburg-Nurnberg AG. Damping device for rapidly spinning rotary body. 3,856,200, Cl. 233-1.00c.
Lieberman, Stuart I.; and Hopp, Theodore H. Digital counter frequency control system. 3,857,107, Cl. 331-1.00a.
Light, Richard U., to Flat-Back Corporation. Portable vertebral column support. 3,856,349, Cl. 297-230.000.
Lilas, Les: *See—*
Allais, Andre; Lilas, Les; and Nomine, Gerard, 3,856,967.
Lilly, Eli, and Company: *See—*
Hamill, Robert L.; and Hoehn, Marvin M., 3,856,940.
Jackson, Richard L., 3,856,771.
Smithwick, Edward L., Jr., 3,856,848.
Lindberg, Richard S.; and Armstrong, G. Leslie, to U.S. Reduction Co. Aluminum base alloy die casting wheel. 3,856,360, Cl. 301-65.000.
Lindbert, Brook A.; McCollum, Wesley L.; and Mertz, Edward H., to General Motors Corporation. Occupant restraint system. 3,856,326, Cl. 280-150.0ab.
Linde Aktiengesellschaft: *See—*
Simon, Johannes; Etzbach, Volker; Grimm, Peter; and Ford, Wolfgang, 3,855,810.
Linde, Hans, to Berthold, H., AG, Firma. Film holding arrangement for photosetting machine. 3,856,394, Cl. 354-275.000.
Lindsay, Harry Lee: *See—*
Dusza, John Paul; Lindsay, Harry Lee; and Bernstein, Seymour, 3,856,838.
Lines, Gregory L.: *See—*
Chung, Tae H.; Dillon, Michael L.; and Lines, Gregory L., 3,856,862.
Linforth, William J.: *See—*
Doe, Ewart H.; and Linforth, William J., 3,856,197.
Linn, Bruce O., to Merck & Co. Inc. Anticoccidial composition containing guanidine derivatives. 3,856,975, Cl. 424-304.000.
Linstromberg, William J., to Whirlpool Corporation. Domestic ice maker and defrost timer. 3,855,812, Cl. 62-135.000.
Lion Fat & Oil Co., Ltd.: *See—*
Susuki, Rinnosuke; Hoshi, Hiroshi; Saito, Jiro; Murakami, Keiichi; and Yamada, Hisashi, 3,856,746.
Yamaguchi, Tadashi; Ono, Takayuki; Hoshi, Hiroshi; Hirakawa, Michio; and Watanabe, Isao, 3,856,745.
Lion Fat and Oil Co., Ltd.: *See—*
Susuki, Rinnosuke; Hoshi, Hiroshi; Satto, Jiro; Takano, Koichi; and Kosikawa, Kiyoshi, 3,856,614.
Lion Yushi Kabushiki Kaisha: *See—*
Yamaguchi, Tadashi; Ono, Takayuki; Hoshi, Hiroshi; Hirakawa, Michio; and Watanabe, Isao, 3,856,745.
Lipke, Donald L.: *See—*
Tann, Lewis H.; Carroll, Robert J.; and Lipke, Donald L., 3,855,708.
Lipschutz, Paul, to Societe d'Exploitation des Brevets Neiman. Cylinder lock. 3,855,829, Cl. 70-362.000.
Lipscomb, David J., to Lockheed Aircraft Corporation. Leak detection coating for aircraft flexible fuel cells. 3,856,465, Cl. 23-230.00l.
Litton Systems, Inc.: *See—*
Maughmer, Robert W.; and Yamamoto, John R., 3,856,403.
Liucci, Frank Victor: *See—*
Guggenheim, Robert Clifton, Sr.; and Liucci, Frank Victor, 3,855,738.
Lochet, Jean A.: *See—*
Bick, Maurice; and Lochet, Jean A., 3,856,638.
Lockheed Aircraft Corporation: *See—*
Lipscomb, David J., 3,856,465.
Lodige, Fritz: *See—*
Lodige, Wilhelm; Lodige, Fritz; and Lucke, Josef, 3,856,271.
Lodige, Wilhelm; Lodige, Fritz; and Lucke, Josef. Mixing device for gluing wood shavings. 3,856,271, Cl. 259-25.000.
Loeber, Frederick W., to Ameron, Inc. Orthotropic trailer. 3,856,344, Cl. 296-28.00m.
Loev, Bernard: *See—*
Bender, Paul E.; and Loev, Bernard, 3,856,822.
Loev, Bernard, to SmithKline Corporation. 2-Aminomethyl dibenzo (b,d) pyrans. 3,856,820, Cl. 260-345.300.
Loev, Bernard, to SmithKline Corporation. Alkoxy dibenzo (b,d) pyrans. 3,856,821, Cl. 260-345.300.
Loev, Bernard, to SmithKline Corporation. Dibenzo (b,d) pyrans. 3,856,823, Cl. 260-345.300.
Loewe-Opta GmbH: *See—*
Kanow, Willy, 3,857,108.
Lohrmann, Dieter R., to United States of America, Army. Mixer for controlling the frequency accuracy of a variable frequency oscillator. 3,857,099, Cl. 325-436.000.
Lonnemo, Kurt R., to Sperry Rand Corporation. Power transmission. 3,856,436, Cl. 417-212.000.
Loon, Fred G., to Ford Motor Company. Rocker arm. 3,855,981, Cl. 123-90.270.
Looney, John H., to Xerox Corporation. Inverter-reverser for a reproduction machine. 3,856,295, Cl. 271-65.000.
Loop-A-Line, Inc.: *See—*
McGahee, Welbourne D., 3,855,723.
Lopez, Juan M.: *See—*
Poliak, John M.; Weitzman, Milton J.; and Lopez, Juan M., 3,856,376.
Lordan, Jack M., to United States of America, Air Force. Reentry vehicle nose tip flight testing apparatus. 3,855,849, Cl. 73-86.000.
Lorenzoni, Loreno: *See—*
Messina, Giuseppe; Lorenzoni, Loreno; and Bertolini, Natale, 3,856,878.
Lose, John G.; and Roth, John F., to Gulf & Western Manufacturing. Drive linkage for double action press. 3,855,839, Cl. 72-417.000.
Losenhausen Maschinenbau AG.: *See—*
Waschulewski, Hans-Georg; Baumers, Hans; and Gerresheim, Dusseldorf, 3,856,426.
Louis, Meelis Nicolaus: *See—*
Van den Boogaart, Krijn; and Louis, Meelis Nicolaus, 3,856,836.
Louks, Gordon D.: *See—*
Louks, Robert A.; and Louks, Gordon D., 3,855,761.
Louks, Robert A.; and Louks, Gordon D. Apparatus and method for removing tassels. 3,855,761, Cl. 56-51.000.
Lovell, John A.; and Harris, Philip G., to Goodyear Tire & Rubber Company, The. Adhesive for concrete and method of preparation. 3,856,741, Cl. 260-37.00n.
Lovendahl, Norman H. Adjustable boring tool. 3,856,427, Cl. 408-183.000.
Lowe, Warren, to Chevron Research Company. Acid neutralization accelerating compositions. 3,856,687, Cl. 252-33.400.
Lubrizol Corporation, The: *See—*
Hoke, Donald Irvin, 3,856,689.
Lucas Electrical Company Limited, The: *See—*
Allport, Maurice James, 3,857,084.
Luce, John B., to General Electric Company. Flame retardant polymer composition. 3,856,887, Cl. 260-88.0dr.
Luce, Nunzio A., to Optel Corporation. Digital electronic timepiece. 3,855,783, Cl. 58-50.00r.
Lucht, Alfred, to Messer Griesheim GmbH. Device for applying flame-scarfing powder. 3,856,282, Cl. 266-23.00h.
Lucke, Josef: *See—*
Lodige, Wilhelm; Lodige, Fritz; and Lucke, Josef, 3,856,271.
Lucki, Stanley J.: *See—*
Weisz, Paul B.; Chen, Nai Yuen; and Lucki, Stanley J., 3,855,980.
Luger, Benjamin. Belt reversing mechanism. 3,855,637, Cl. 2-301.000.
Luke, Robert R.: *See—*
Adair, James C.; and Luke, Robert R., 3,856,095.
Lukkarinen, Erkki, to Konttorikoneteollisuus Oy. Machine for selectively cutting and gluing address labels. 3,856,604, Cl. 156-361.000.
Lummus Company, The: *See—*
Sze, Morgan C.; and Snell, George J., 3,856,675.
Lunden, Jack. Signal control device. 3,855,710, Cl. 33-295.000.

Lundstrom, Harry, to Allmanna Svenska Elektriska Aktiebolaget. Convertor equipment comprising a plurality of single-phase convertor bridges. 3,857,083, Cl. 321-14.000.

Lutts, Carlton G.; and Stewart, James R., to USM Corporation. Mechanism for separating flexible plies from a stack. 3,856,294, Cl. 271-10.000.

Lutz, Verna. Convertible broom rake. 3,855,766, Cl. 56-400.180.

Luviano, John J., to Crown Cork & Seal Company, Inc. Easy-opening container closure having a sliding tab. 3,856,184, Cl. 222-80.000.

Lynch, Thomas; Berner, Douglas G.; and Hynes, Frank R., to Xerox Corporation. Slitter/perforator apparatus. 3,855,890, Cl. 83-331.000.

M. J. Manufacturing Consultants, Inc.: *See—*
Jensen, Dennis H.; and McKinley, Thomas E., 3,856,290.

Maas, Fred L., to Paper Novelty Manufacturing Co. Hanging decoration. 3,856,609, Cl. 161-16.000.

Macall, Thomas F., to Midland Capital Corporation, mesne. Ballistic linear bidirectional scanner system. 3,856,382, Cl. 350-285.000.

Macco Oil Tool Company, Inc.: *See—*
Dinning, Robert W., 3,856,082.

MacDonald, Alan A., to Stauffer Chemical Company. Alkyloxalyl amino-s-triazines. 3,856,793, Cl. 260-249.800.

MacDonald, Richard C.; and Martin, Noel E., to Canadian International Paper Company. Stabilized absorbent pad. 3,856,012, Cl. 128-284.000.

MacGuire-Cooper, Richard Terence. Valves. 3,856,263, Cl. 251-347.000.

Machurat, Jean: *See—*
Vrisakis, George; and Machurat, Jean, 3,856,723.

MacInnis, Martin B.: *See—*
Pagnozzi, L. Rita; Kim, Tai K.; Laferty, John M.; and MacInnis, Martin B., 3,856,915.

Mack, Raymond E.; Patel, Kiritkumar R.; and Crist, Edward C., to Eaton Corporation. Counterweighted torque transmitting mechanism. 3,856,124, Cl. 192-88.00b.

Mackie, James, & Sons, Limited: *See—*
Mackie, John K. P., 3,856,223.

Mackie, John K. P., to Mackie, James, & Sons, Limited. Winding machine. 3,856,223, Cl. 242-26.300.

MacMaster, George H.; and Dudley, Kenneth W., to Raytheon Corporation. Microwave browning means. 3,857,009, Cl. 219-10.550.

Macovski, Albert, to American Express Investment Management Company, mesne. Scanned holography systems using temporal modulation. 3,856,986, Cl. 178-6.500.

Maden, John: *See—*
Marsden, Frank Charles; Maden, John; and Flanagan, Paul Frederick, 3,856,834.

Maeda, Katsumi: *See—*
Suzuki, Hidenori; Maeda, Katsumi; Nakatani, Keiji; and Ishii, Kenjiro, 3,856,397.

Maeda, Kazuo; Takizawa, Muneto; and Saito, Yuzi, to Mitsui Shipbuilding and Engineering Co., Ltd. Apparatus for removing pipes from a conveyor. 3,856,130, Cl. 198-24.000.

Maeda, Moriichi; Onuki, Akio; and Kusano, Kazuya, to Kinyo-Sha Co., Ltd. Method of making a porous polymeric material. 3,856,914, Cl. 264-41.000.

Maekawa, Hideyuki; and Nakanishi, Masaichi, to Shionogi & Co., Ltd. Compartmentalized container. 3,856,138, Cl. 206-221.000.

Magnetic Laboratories, Inc.: *See—*
Kasmer, Thomas E., 3,857,077.

Mahmoud, Ali R.: *See—*
Buchele, Wesley F.; and Mahmoud, Ali R., 3,856,022.

Major, Peter Colin; and Ogden, Kenneth Whittier, to Thorn Electrical Industries Limited. Ballast circuits for discharge lamps. 3,857,063, Cl. 315-170.000.

Mallow, William A.; Owen, Richard A.; and Baker, Ethelbert J., Jr., to Southwest Research Institute. Solidified silica foam product and process. 3,856,539, Cl. 106-75.000.

Malmin, Oscar. Endodontic operating and sealing method and apparatus therefor. 3,855,702, Cl. 32-15.000.

Malmin, Oscar. Endodontic operating system. 3,855,705, Cl. 32-40.00r.

Malvestuto, Frank S., Jr. Aircraft transporter. 3,856,238, Cl. 244-5.000.

Mammino, Joseph; and Amidon, Alan B., to Xerox Corporation Liquid electrostatographic developer compositions. 3,856,692, Cl. 252-62.100.

Manabe, Haruo: *See—*
Yashima, Saburo; Manabe, Haruo; Ito, Takuma; and Namikawa, Keishi, 3,856,666.

Manabe, Kuniyoshi: *See—*
Takagi, Kazumi; Murakami, Masahiro; and Manabe, Kuniyoshi, 3,856,882.

Manbritt Industries, Inc.: *See—*
Britten, George C., 3,856,450.

Mandeville, Arthur R., to Scott Paper Company. Method of drying an electrophotographic support element. 3,856,555, Cl. 117-37.0le.

Mangold, James, to Societe Anonyme D.B.A. Vehicle antiskid braking system. 3,856,364, Cl. 303-21.00f.

Mann, Morley. Post driver. 3,856,092, Cl. 173-122.000.

Mannesmann Aktiengesellschaft: *See—*
Elm, Karl Horst; Schatton, Paul; and Kruse, Joachim, 3,856,337.

Manning, Donald L., to General Motors Corporation. Engine cooling and noise abatement system. 3,856,100, Cl. 180-54.00a.

Manning, Harold E., to Petro-Tex Chemical Corporation. Metal vanadite catalyzed oxidative dehydrogenation process. 3,856,881, Cl. 260-680.00e.

Mansell, Henry J., to Meps, Inc., mesne. Apparatus and method for treating exhaust gases of combustion. 3,856,485, Cl. 55-73.000.

Maravetz, Lester L., to Esso Research and Engineering Company. N-Cyclopropylmethyl halo-acetamides. 3,856,860, Cl. 260-561.0hl.

Marck Patent Gesellschaft mit beschrankter Haftung: *See—*
Dahm, Johann; Borck, Joachim; Nowak, Herbert; Simane, Zdenek; and Kayser, Detlev, 3,856,812.

Marconi Company, Limited, The: *See—*
Wisbey, Philip Henry, 3,857,115.

Marcus, Ilan: *See—*
Cehovic, Georges; Gabbai, Albert; Marcus, Ilan; and Posternak, Theodore, 3,856,776.

Maremont Corporation: *See—*
Terry, Stanley M.; and Gray, Alden J., 3,856,999.

Margotte, Dieter; Vernaleken, Hugo; and Schnell, Hermann, to Bayer Aktiengesellschaft. Blends of polycarbonate crafts on vinyl polymers with polycarbonates and/or vinyl polymers. 3,856,886, Cl. 260-873.000.

Margraf, Harry W., to Washington University. Silver zinc allantoin complex. 3,856,805, Cl. 260-299.000.

Marine Colloids, Inc.: *See—*
Forget, Ronald D.; and Saravis, Calvin A., 3,855,846.

Marion Power Shovel Company, Inc.: *See—*
Baron, George B., 3,856,161.

Markley, Jerry M., to Sackner Products, Inc. Decorative panel with finished edges. 3,856,611, Cl. 161-43.000.

Marsden, Frank Charles; Maden, John; and Flanagan, Paul Frederick. Glyceride oil refining processes. 3,856,834, Cl. 260-425.000.

Marshall, Struan Robertson Lockhart. Adjustable stop means. 3,855,885, Cl. 82-34.00b.

Martin, Daniel B.: *See—*
Strain, Donny R.; and Martin, Daniel B., 3,856,033.

Martin, David G.: *See—*
Hanka, Ladislav J.; and Martin, David G., 3,856,807.

Martin, John Henry Edward James: *See—*
Ellestad, George Alfred; Martin, John Henry Edward James; and Porter, John Norman, 3,856,939.

Martin, Lawrence L.; Martin, Ronald C.; and Sixt, Marty E., to Advanced Drainage Systems, Inc. Rigid corrugated tubing. 3,855,799, Cl. 61-11.000.

Martin, Noel E.: *See—*
MacDonald, Richard C.; and Martin, Noel E., 3,856,012.

Martin, Robert C., to Dow Chemical Company, The. Hydraulic cement and method of cementing in environments having elevated temperatures. 3,856,541, Cl. 106-90.000.

Martin, Ronald C.: *See—*
Martin, Lawrence L.; Martin, Ronald C.; and Sixt, Marty E., 3,855,799.

Martini, William R.: *See—*
Noble, Jack E.; Riggle, Peter; Emigh, Stuart G.; and Martini, William R., 3,855,795.

Martone, James F.: *See—*
Jablonski, Richard B.; and Martone, James F., 3,856,554.

Marx, Guenter H. Apparatus for transferring a gas between two liquids. 3,856,475, Cl. 23-258.500.

Masaki, Kenji; and Etoo, Yukihiro, to Nissan Motor Company Limited. Warming-up apparatus for internal combustion engine. 3,855,975, Cl. 123-41.130.

Maschinenfabrik Augsburg-Nurnberg AG: *See—*
Lieb, Helmut, 3,856,200.

Maschinenfabrik Rissen GmbH: *See—*
Schmidt, Werner, 3,855,908.

Mason, William D., Jr.: *See—*
Summers, Robert L., 3,856,682.

Massey, Lester G.: *See—*
Tarman, Paul B.; and Massey, Lester G., 3,856,928.

Masuoka, Michio: *See—*
Hiraga, Kentaro; Yoshioka, Kouichi; Golo, Giichi; Nakayama, Ryo; and Masuoka, Michio, 3,856,829.

Mather Company, The: *See—*
Ordorica, Miguel A., 3,856,329.

Mathis, Ronald D.: *See—*
Guillory, Jack P.; and Mathis, Ronald D., 3,856,750.

Matsukawa, Hiroharu: *See—*
Hayashi, Takao; Matsukawa, Hiroharu; and Kiritani, Masataka, 3,856,553.

Matsumoto, Chinami: *See—*
Kato, Tadanari; Ikemi, Tadashi; Ooishi, Tutomu; Sano, Mitsuyoshi; Hayashida, Kengo; and Matsumoto, Chinami, 3,856,707.

Matsumoto, Josie, 20% to Lee, Raymond, Organization, Inc., The. Massage device. 3,856,002, Cl. 128-67.000.

Matsumoto, Seiichi: *See—*
Hosoe, Kazuya; and Matsumoto, Seiichi, 3,856,399.

Matsumoto, Takao; and Aoki, Masaru, to Tomy Kogyo Co., Ltd. Boxing game. 3,856,304, Cl. 273-85.00f.

Matsunaka, Sadayoshi: *See—*
Sakai, Kouichi; Tokai, Yoshiaki; and Matsunaka, Sadayoshi, 3,856,884.

Matsuoka, Masami: *See—*
Ueshima, Takashi; Kobayashi, Shoichi; and Matsuoka, Masami, 3,856,758.

Matsushita Electric Industrial Co., Ltd.: *See—*
Hosono, Hiroo; Minamide, Seiko; Hukushima, Juichi; Kudou, Yoku; and Kimura, Shunichiro, 3,856,228.
Tada, Siro, 3,855,963.
Uchida, Kosaku; Ide, Susumu; Kanamaru, Toshiji; and Kitamura, Sadafumi, 3,855,962.
Uchida, Kosaku; Ide, Susumu; Kanamaru, Toshiji; and Kitamura, Sadafumi, 3,855,964.

Matsushita Electric Industrial Company, Limited: *See—*
Hashimoto, Masafumi; and Shimura, Yasuo, 3,856,588.
Nishino, Atsushi; Kumano, Hiroshi; and Iura, Yukihide, 3,855,914.
Tomii, Kaoru; and Miyama, Hiroshi, 3,857,037.

Matsushita Electric Works, Ltd.: *See—*
Nishio, Minoru; and Sagawa, Norio, 3,857,003.

Matsuzaki, Takashi: *See—*
Seki, Toshio; Suzuki, Kazaburo; and Matsuzaki, Takashi, 3,856,727.

Mattel Inc.: *See—*
Sapkus, Jurgis; Lewis, J. Stephen; Vowles, Colin; and Yarbrough, William R., 3,855,729.

Mauck, Robert J., to Buta, John J. Boat trailer construction. 3,856,168, Cl. 214-505.000.

Maughmer, Robert W.; and Yamamoto, John R., to Litton Systems, Inc. Velocity biased laser velocimeter. 3,856,403, Cl. 356-28.000.

Mausner, Marvin L.; and Dater, Arnold H., to Witco Chemical Corporation. Liquid detergent compositions. 3,856,711, Cl. 252-545.000.

Max-Plank-Gesellschaft zur Forderung der Wissenschafter e.V.: *See—*
Hoppe, Walter, 3,857,034.

Maxey, Frank S., to Goodyear Tire & Rubber Company, The. Sulfur vulcanization system containing a two-component accelerator system. 3,856,761, Cl. 260-79.50b.

May, Joseph N.: *See—*
Hynes, Frank R.; May, Joseph N.; and Thompson, David M., 3,856,460.

May, Michael Exton. Tablet of a chlorine releasing solid compound. 3,856,932, Cl. 424-16.000.

May, Peter John: *See—*
Phillipps, Gordon Hanley; May, Peter John; McDonald, Brian; and Woollett, Edward Arthur, 3,856,828.

Mayer, Hartmut, to Bosch, Robert, G.m.b.H. Apparatus to control the air-fuel mixture supplied to internal combustion engines. 3,855,974, Cl. 123-320.00a.

Mayeur, Eugene: *See—*
Hirsch, Jean-Jacques; Mayeur, Eugene; and Mayeur, Jacky, 3,856,055.

Mayeur, Jacky: *See—*
Hirsch, Jean-Jacques; Mayeur, Eugene; and Mayeur, Jacky, 3,856,055.

Mazzotta, G. James. Shoe moulds. 3,855,657, Cl. 12-142.0rs.

MB Associates: *See—*
Mulich, Stephen F.; Duffy, Donald R.; and Salter, Steven J., 3,855,930.

McArthur, Dennis P., to Union Oil Company of California. Aluminum borate catalyst compositions. 3,856,702, Cl. 252-432.000.

McArthur, Dennis P., to Union Oil Company of California. Aluminum borate catalyst compositions. 3,856,705, Cl. 252-432.000.

McCall, Robert Eugene, to Industrial Nucleonics Corporation. Method and apparatus for improving the uniformity of the basic weight of a fabric. 3,857,023, Cl. 235-151.100.

McCollum, Wesley L.: *See—*
Lindbert, Brook A.; McCollum, Wesley L.; and Mertz, Edward H., 3,856,326.

McConnell, Richard L., to Eastman Kodak Company. Blends containing polyethylene and an unsaturated polycarboxylic acid modified polyolefin. 3,856,889, Cl. 260-897.00b.

McCord Corporation: *See—*
Dreher, James Howard, 3,856,615.
Kavthekar, Keshav S.; and Clemett, Edwin F., Jr., 3,857,004.
Weller, Peter A., 3,856,613.

McDermott, David C., to Shell Oil Company. Method and apparatus for cleaning the interior of industrial vessels by using rotating nozzle heads. 3,856,570, Cl. 134-24.000.

McDonald, Brian: *See—*
Phillipps, Gordon Hanley; May, Peter John; McDonald, Brian; and Woollett, Edward Arthur, 3,856,828.

McDonald, Wilson C., to Goodyear Aerospace Corporation. Protective panel for a vehicle door. 3,855,898, Cl. 89-36.00h.

McElroy, David C.: *See—*
Seifert, Lester H.; Powers, Raymond P.; Schmidt, William M.; Thorwaldsen, Stanley E.; Smith, Frederick W.; McElroy, David C.; and Dunton, Roy P., 3,855,763.

McElroy, Roderick O.; and Duncan, Douglas W., to British Columbia Research Council. Copper extraction by rapid bacteriological process. 3,856,913, Cl. 423-27.000.

McEowen, James Royce: *See—*
James, Dennis Bryan; and McEowen, James Royce, 3,857,072.

McGahee, Welbourne D., to Loop-A-Line, Inc. Fishing apparatus and quick connectors therefor. 3,855,723, Cl. 43-44.830.

McGinnis, Paul H., Jr., to Celanese Corporation. Non-woven structures. 3,856,612, Cl. 161-108.000.

McGraw Edison Company: *See—*
Potter, Richard W., 3,855,919.

McHattie, Lloyd E.: *See—*
Kuehn, Lorne A.; and McHattie, Lloyd E., 3,855,863.

McIntosh, Arthur J. Device for treatment of bloat of ruminants. 3,856,021, Cl. 128-347.000.

McKendrick, Lorne J. Balancing apparatus with servo relief valve. 3,856,266, Cl. 254-168.000.

McKinley, Thomas E.: *See—*
Jensen, Dennis H.; and McKinley, Thomas E., 3,856,290.

McMann, Renville H.; and Peit, Joseph G., to Columbia Broadcasting System, Inc. Horizontal stabilizing system for film scanner. 3,856,987, Cl. 178-6.70a.

McMickle, John F., Jr., to Cozzoli Machine Company. Stopper inserting machine. 3,855,749, Cl. 53-306.000.

McMillian, Lonnie S.: *See—*
Hutchison, Arthur H.; and McMillian, Lonnie S., 3,857,065.

McNeely, Gerald Willard: *See—*
Henry, Charles Leroy; and McNeely, Gerald Willard, 3,856,753.

McPeak, Warren L. Locking universal joint. 3,855,884, Cl. 81-177.0uj.

McQueen, Norman: *See—*
Sobey, Albert J.; McQueen, Norman; and Larsen, Robert R., 3,856,106.

Mead, John A. R., to United States of America, Health, Education and Welfare. Inhibition of leukemia L1210 in mice utilizing 5-methyltetrahydrohomofolate. 3,856,959, Cl. 424-251.000.

Medtronic, Inc.: *See—*
Bolduc, Lee R., 3,855,996.
Mulier, Pieter M. J.; and Jirak, Thomas L., 3,857,085.

Mehl, Wolfgang: *See—*
Halfar, Kurt; Hitchman, Michael L.; and Mehl, Wolfgang, 3,856,640.

Meier, Ernst, to Interstop AG. Removable slide guide for a slide closure. 3,856,189, Cl. 222-537.000.

Meier, Hermann: *See—*
Kartte, Klaus; Fuchs, Hugo; Jockers, Kurt; Kahr, Kurt; and Meier, Hermann, 3,856,924.

Meier, Jean: *See—*
Allais, Andre; Meier, Jean; and Cerede, Jean, 3,856,909.

Melugin, Leland A.: *See—*
Higginbotham, Roy F.; Melugin, Leland A.; and Hendrickson, Donald Carl, 3,857,020.

Menary, Robert F., to Paulmar Incorporated. Apparatus for inspecting strip material. 3,856,414, Cl. 356-200.000.

Menke, Wilhelm, to NSM Apparatebau GmbH Kommanditgesellschaft. Coin operated apparatus. 3,856,126, Cl. 194-1.00r.

Menshen, Arnold. Clamping apparatus. 3,856,244, Cl. 248-54.00r.

Menzel, Gerhard; Seidel, Eckhard; and Jaenichen, Gunther, to Chemische Werke Huls Aktiengesellschaft. Thermoplastic compound of polybutene-1. 3,856,726, Cl. 260-23.00h.

Menzies, John Ian; and Menzies, Maureen, to Heatshield Research and Development Pty. Ltd. Apparatus for making heat-insulating panel or sheel. 3,856,608, Cl. 156-468.000.

Menzies, Maureen: *See—*
Menzies, John Ian; and Menzies, Maureen, 3,856,608.

Meps, Inc., mesne: *See—*
Mansell, Henry J., 3,856,485.

Mercer, James B. Treatment of viral influenza infections. 3,856,966, Cl. 424-273.000.

Merck & Co. Inc.: *See—*
Linn, Bruce O., 3,856,975.

Merit Systems, Inc.: *See—*
Patterson, Merle W.; and Caves, Lawrence C., Jr., 3,855,745.

Merkl, George G. Aluminum organoiodides. 3,856,841, Cl. 260-448.00a.

Merlino, Eugene L., Jr.; Naeyaert, Roger S., Jr.; and Ellis, Jonas, to Burroughs Corporation. System for anticipating an impending loss of information and for generating a restraint signal in response thereto. 3,856,984, Cl. 178-23.00a.

Merola, Anthony, to Amerola Products Corporation. Retention of vise combination. 3,856,292, Cl. 269-135.000.

Merrell, Richard L., to General Motors Corporation. Inflator. 3,856,180, Cl. 222-5.000.

Merrell, Richard L., to General Motors Corporation. Inflator. 3,856,181, Cl. 222-5.000.

Mertz, Edward H.: *See—*
Lindbert, Brook A.; McCollum, Wesley L.; and Mertz, Edward H., 3,856,326.

Merzlikin, Sergei Filippovich: *See—*
Prudkovsky, Garald Petrovich; Khotina, Alexandra Vasilievna; Sushkin, Nikolai Gavrilovich; Kopnev, Lev Nikolaevich; and Merzlikin, Sergei Filippovich, 3,857,014.

Messer Griesheim GmbH: *See—*
Lucht, Alfred, 3,856,282.

Messerschmitt-Bolkow-Blohm GmbH: *See—*
Woitsch, Werner, 3,855,939.

Messina, Gino. Pivot hinge. 3,855,667, Cl. 16-168.000.

Messina, Giuseppe; Lorenzoni, Loreno; and Bertolini, Natale, to Societa' Italiana Resine S.I.R. S.p.A. Process for the alkylation of aromatic hydrocarbons. 3,856,878, Cl. 260-671.00c.

Messineo, Joseph R., to United States of America, Army. Dual purpose grenade. 3,855,933, Cl. 102-56.000.

Metzger, Karl Georg: *See—*
Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,856,957.

Metzger, William J., to Midland-Ross Corporation. Railway car coupler. 3,856,156, Cl. 213-151.000.

Meyer, Engelbert A., to USM Corporation. Adjustable strap with quick release. 3,855,669, Cl. 24-16.0pb.

Meyer, Gerald; and Buzzi, Leo, to U.S. Philips Corporation. Shaving head for dry-shaving apparatus. 3,855,697, Cl. 30-34.100.

Meyer, Hans Ulrich. Electrical length measuring system. 3,857,092, Cl. 324-61.00r.

Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, to Bayer Aktiengesellschaft. Bicyclic derivatives of 1,4-dihydropyridine. 3,856,798, Cl. 260-294.80c.

Meyer, Kenneth H.; and Heese, William E., to Hydrapower Inc. Synchronized piston assembly. 3,855,794, Cl. 60-546.000.

Meyer, Roy E.; and Wahl, John F., to Wahl Clipper Corporation. Device for drying hair. 3,857,016, Cl. 219-368.000.

Meyers, Edward: *See—*
Murao, Sawao; Meyers, Edward; and Parker, William Lawrence, 3,856,938.

Michalski, Arnold: *See—*
Stegelman, Albert F.; and Michalski, Arnold, 3,857,012.

Micromedic Systems, Inc.: *See—*
Sanz, Manuel C.; and Revillet, Georges, 3,856,415.

Middleton, Carlisle A. Tobacco harvester with improved spearing system. 3,855,762, Cl. 56-27.500.

Midland Capital Corporation, mesne: *See—*
Macall, Thomas F., 3,856,382.

Midland-Ross Corporation: *See—*
De Penti, Kenneth L., 3,856,154.
Metzger, William J., 3,856,156.

Milberger, Lionel J.: *See—*
Swift, Gilbert; Moore, William M.; and Milberger, Lionel J., 3,856,410.

Miles Laboratories Inc.: *See—*
Genshaw, Marvin Alden; and Smith, Melvin Dee, 3,856,649.

Miles, Perry A.: *See—*
United States of America, National Aeronautics and Space Administration, 3,856,402.

Miles, Thomas R., to Hines, Edward, Lumber Co. Method of cutting lumber to random or specified clear lengths. 3,856,061, Cl. 144-312.000.

Miller, Alfred D., to ICI United States Inc. 8-Oxa-3-azabi cyclo(3.2.1)octane compounds. 3,856,783, Cl. 260-240.00d.

Miller, Allen R.: *See—*
Miller, Charles P.; Miller, Allen R.; and Miller, David J., 3,856,425.

Miller Brothers: *See—*
Miller, Norman K., 3,855,733.

Miller, Charles P.; Miller, Allen R.; and Miller, David J., to Miller Formless Co., Inc. Adjustable side for slip form. 3,856,425, Cl. 404-84.000.

Miller, David J.: *See—*
Miller, Charles P.; Miller, Allen R.; and Miller, David J., 3,856,425.

Miller Formless Co., Inc.: *See—*
Miller, Charles P.; Miller, Allen R.; and Miller, David J., 3,856,425.

Miller, Herman, Inc.: *See—*
Propst, Robert L., 3,855,655.

Miller, John S.; and Fuqua, Lloyd T., to General Motors Corporation. Wedge base light bulb. 3,857,056, Cl. 313-318.000.

Miller, Julius, to Nouveau Products Corporation. Self-compensating extensible beam. 3,856,251, Cl. 248-280.000.

Miller, Keith A., to Air Products and Chemicals, Inc. Burner of the oxy-fuel type. 3,856,457, Cl. 431-353.000.

Miller, Leslie E. Cooling device for portable chest. 3,855,816, Cl. 62-387.000.

Miller, Louis D., to United States of America, Army. Infrared vidicon with off-axis electron gun. 3,857,035, Cl. 250-338.000.

Miller, Norman K., to Miller Brothers. Sensitive edge for a door. 3,855,733, Cl. 49-488.000.

Milligan, Barton: *See—*
Delamater, George B.; and Milligan, Barton, 3,856,673.

Mills, Maurice T.: *See—*
Savage, Donald D.; and Mills, Maurice T., 3,856,060.

Minami, Nagio: *See—*
Nishio, Yasuhiro; Yamamoto, Yoshiriro; Okamoto, Zenichiro; Minami, Nagio; and Nagareda, Masazumi, 3,857,010.

Minami, Toshio: *See—*
Omura, Etuzou; Minami, Toshio; and Kusunose, Tetsuhiro, 3,855,776.

Minamide, Seiko: *See—*
Hosono, Hiroo; Minamide, Seiko; Hukushima, Juichi; Kudou, Yoku; and Kimura, Shunichiro, 3,856,228.

Mine Safety Appliances Company: *See—*
Vessalo, William V., 3,856,142.

Minet, Roger P.; Debeau, Jean H.; and Thepault, Ernest L. Superconductive microwave filter. 3,857,114, Cl. 333-73.00s.

Minnesota Mining & Manufacturing Company: *See—*
Deyak, Frank L., 3,856,552.

Minnesota Mining and Manufacturing Company: *See—*
Krinke, Harlan L., 3,857,029.

Minnestoa Mining and Manufacturing Company: *See—*
Harrison, Henry F.; and Davis, Moses P., Jr., 3,856,706.

Minolta Camera Kabushiki Kaisha: *See—*
Kosaka, Takeshi, 3,857,024.
Kushima, Teizo; Tanaka, Susumu; and Ogawa, Masaya, 3,856,396.
Suzuki, Hidenori; Maeda, Katsumi; Nakatani, Keiji; and Ishii, Kenjiro, 3,856,397.

Miquel, Jean: *See—*
Sugier, Andre; and Miquel, Jean, 3,856,661.

Miram, Oleg V. Module for building construction. 3,855,744, Cl. 52-126.000.

Mississippi State University Development Foundation, Inc.: *See—*
Thomas, Charles C., 3,856,233.

Mitchell, William, to Motion Mini Car Corporation. Torsion bar plate. 3,856,286, Cl. 267-57.000.

Mitchie, Robert Edward; and Price, Peter Michael Myatt, to Vickers Limited. Method and apparatus for measuring the thickness of a coating on a substrate. 3,857,095, Cl. 324-71.00r.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Kato, Satoru; Fukuda, Kouki; and Nannichi, Kuninobu, 3,856,488.
Saito, Nagao; Kobayashi, Kazuhiko; and Tomimoto, Naokazu, 3,857,011.

Mitsubishi Gas Chemical Company, Inc.: *See—*
Miyamoto, Akira; Akiyama, Hiroyuki; Noguchi, Toshiaki; and Ohtsuka, Isao, 3,856,719.
Tsuchiya, Hideshi; Takematsu, Tetsuo; Hasegawa, Yoichi; and Furushima, Masakazu, 3,856,850.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Iwata, Tokushige; Sakamoto, Kiyoaki; Nawata, Teruo; Endo, Hiroyasu; Nakano, Masaru; and Murayama, Hajime, 3,856,478.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Nishio, Yasuhiro; Yamamoto, Yoshiriro; Okamoto, Zenichiro; Minami, Nagio; and Nagareda, Masazumi, 3,857,010.

Mitsubishi Kinzoku Kogyo Kabushiki Kaisha: *See—*
Iwata, Tokushige; Sakamoto, Kiyoaki; Nawata, Teruo; Endo, Hiroyasu; Nakano, Masaru; and Murayama, Hajime, 3,856,478.

Mitsubishi Rayon Co., Ltd.: *See—*
Ide, Fumio; Asao, Mamoru; Hasegawa, Akira; and Sasaki, Isao, 3,856,894.

Mitsubishi Rayon Company, Ltd.: *See—*
Nakamoto, Hideo; Kobayashi, Juichi; and Kobayashi, Takashi, 3,856,643.

Mitsui Shipbuilding and Engineering Co., Ltd.: *See—*
Maeda, Kazuo; Takizawa, Muneto; and Saito, Yuzi, 3,856,130.
Moriguchi, Shigeru; Takeuchi, Tetsuo; and Saito, Yuzi, 3,855,687.

Mitts, Richard K.; and Tyler, Hugh Jean, to Robertshaw Controls Company. Winding apparatus. 3,856,057, Cl. 140-102.000.

Miyama, Hiroshi: *See—*
Tomii, Kaoru; and Miyama, Hiroshi, 3,857,037.

Miyamoto, Akira; Akiyama, Hiroyuki; Noguchi, Toshiaki; and Ohtsuka, Isao, to Mitsubishi Gas Chemical Company, Inc. and Japan Styrene Paper Incorporation. Process for producing foamed thermoplastic resin articles. 3,856,719, Cl. 260-2.5ha.

Miyamoto, Masuo: *See—*
Yokotani, Hajime; Miyamoto, Masuo; and Murata, Tadakazu, 3,856,911.

Miyano, Shizuo; and Kondo, Asaji, to Fuji Photo Film Co., Ltd. Process for producing capsules having walls of a waxy material. 3,856,699, Cl. 252-316.000.

Miyauchi, Toshiyuki: *See—*
Ishimaru, Wataru; and Miyauchi, Toshiyuki, 3,855,880.

Miyazaki, Koshin: *See—*
Kohmoto, Keisuke; and Miyazaki, Koshin, 3,856,847.

Mizobuchi, Kenji: *See—*
Yokoi, Hiromu; Ito, Kenichi; and Mizobuchi, Kenji, 3,856,985.

Mizuba, Seth Setsuo: *See—*
Hsu, Charles F.; Jiu, James; and Mizuba, Seth Setsuo, 3,856,852.

Mizuguchi, Kenji: *See—*
Nagasawa, Taro; Hamada, Kozo; Yuguchi, Hiroya; and Mizuguchi, Kenji, 3,856,627.

Mizunuma, Tsutomu; and Yoshida, Takeo, to Denki Kagaku Kogyo Kabushiki Kaisha. Cement additive. 3,856,540, Cl. 106-89.000.

Mlynarski, John J.: *See—*
Blackburn, Dale W.; Devenney, Robert F.; and Mlynarski, John J., 3,856,704.

Mobil Oil Corporation: *See—*
Braid, Milton, 3,856,690.
Burress, George T., 3,856,873.
Dibiasi, D. J., 3,856,747.
Elmore, Jeffrey T., 3,856,680.
Haag, Werner O.; and Olson, David H., 3,856,871.
Hayward, Charles R., 3,856,874.
Morrison, Roger A., 3,856,872.
Owen, Harley, 3,856,659.
Weisz, Paul B.; Chen, Nai Yuen; and Lucki, Stanley J., 3,855,980.
Whitehurst, Darrell Duayne, 3,856,664.

Mocci, Giuseppe: *See—*
Bertolotti, Nino; Sabatini, Bruno; and Mocci, Giuseppe, 3,856,281.

Moehrbach, Rudolf E., to Chicago Pneumatic Tool Company. Sound proofed and air cooled shell for portable air compressor. 3,856,439, Cl. 417-312.000.

Mohrenstein-Ertel, Alexander; and Mohrenstein-Ertel, Michael. Contact free and directly cooled piston arrangement. 3,855,906, Cl. 92-153.000.

Mohrenstein-Ertel, Michael: *See—*
Mohrenstein-Ertel, Alexander; and Mohrenstein-Ertel, Michael, 3,855,906.

Mole, Carmel E.: *See—*
Mole, Frank T.; and Mole, Carmel E., 3,856,190.

Mole, Frank T.; and Mole, Carmel E. Telescoping coat hanger. 3,856,190, Cl. 223-94.000.

Moller, Jens L., to Continental Can Company, Inc. Draw and wall iron process for metal cans. 3,855,862, Cl. 72-334.000.

Molnar, John A.: *See—*
Payne, Calvin L., Jr.; Gambello, Vincent J.; and Molnar, John A., 3,856,303.

Monsanto Company: *See—*
Raffelson, Harold; and Suda, Michael, 3,856,824.

Montalenti, Paolo: *See—*
Porta, Paolo Della; Cataluppi, Angelo; Ferrario, Bruno; and Montalenti, Paolo, 3,856,709.

Montecatini Edison S.p.A.: *See—*
Montesissa, Giorgio; and Piepoli, Francesco, 3,856,725.

Montesissa, Giorgio; and Piepoli, Francesco, to Montecatini Edison S.p.A. Water-soluble resins and methods for their preparation. 3,856,725, Cl. 260-18.0ep.

Moon, Ronald L.; Stein, William W.; and Warnock, Donald, to Varian Associates. Method and apparatus for thermally decomposing a halogenated hydrocarbon to provide a gaseous carrier medium for vapor epitaxial growth. 3,856,585, Cl. 148-175.000.

Mooney, Robert A.; and Bell, John M., to Ford Motor Company. Process for establishing ignition timing of a reciprocating internal combustion engine. 3,857,086, Cl. 324-16.00r.

Moore Business Forms, Inc.: *See—*
Bayne, Justin A.; and Knize, James J., 3,856,196.

Moore, Carl Gordon: *See—*
Angerman, Albert Henry; and Moore, Carl Gordon, 3,856,929.

Moore, George G. I.; and Lappi, Larry R., to Riker Laboratories, Inc. Selective nitration process. 3,856,859, Cl. 260-556.00a.

Moore, James E. Fishing lure construction. 3,855,722, Cl. 43-42.340.

Moore, Phylis T.; and Simon, Myron S., to Polaroid Corporation. Polyviologens. 3,856,714, Cl. 260-2.00r.

Moore Products Co.: *See—*
Adams, Robert B., 3,855,859.

Moore, William M.: *See—*
Swift, Gilbert; Moore, William M.; and Milberger, Lionel J., 3,856,410.

Moorehead, Harvey Robert; and Reading, George R., to Deseret Pharmaceutical Company, Inc. Catheter placement unit with pressure closure. 3,856,010, Cl. 128-214.400.

Morarau, Dinu Stefan. Methods and electrodes for the drying of damp buildings. 3,856,646, Cl. 204-180.00r.

Moraw, Roland: *See—*
Schadlich, Gunther; Haenisch, Renate; and Moraw, Roland, 3,856,529.

Morgan, Charles R., to Grace, W. R., & Co. Radiation curing of solid styrene-allyl alcohol copolymer based polyene-polythiol compositions. 3,856,645, Cl. 204-159.190.

Morgan Construction Company: *See—*
Hill, William J., 3,856,157.

Mori, Atsuhiko: *See—*
Imabori, Junpei; Kuzuoka, Takeshi; and Mori, Atsuhiko, 3,855,842.

Mori, Kenjiro; Ikebe, Shigueaqui; Hirooka, Masaaki; and Kato, Takashi, to Sumitomo Chemical Company, Limited. Lubricant compositions. 3,856,685, Cl. 252-56.00r.

Moriguchi, Shigeru; Takeuchi, Tetsuo; and Saito, Yuzi. to Mitsui Shipbuilding and Engineering Co., Ltd. Apparatus for feeding flanges. 3,855,687, Cl. 29-211.00c.

Morinaga Milk Industry Co., Ltd.: *See—*
Nagasawa, Taro; Hamada, Kozo; Yuguchi, Hiroya; and Mizuguchi, Kenji, 3,856,627.

Morozumi, Eiichi: *See—*
Kishimoto, Hiroyuki; and Morozumi, Eiichi, 3,855,865.

Morris, Earl L.; and Sally, Theodore J., to Acorn Engineering Company. Waste drain connection for plumbing fixtures. 3,855,649, Cl. 4-252.00r.

Morrison, Andrew I.; and Hannah, Bruce R., to Knoll International, Inc. Cushion connection. 3,856,353, Cl. 297-452.000.

Morrison, Harry D.: *See—*
United States of America, National Aeronautics and Space Administration, 3,856,534.

Morrison, Roger A., to Mobil Oil Corporation. Xylene isomerization. 3,856,872, Cl. 260-668.00a.

Morse, William E., Jr. Sign making stencil method. 3,855,924, Cl. 101-129.000.

Morton, Robert Earl, to Leesona Corporation. Strand threading mechanism for ring textile machines. 3,855,769, Cl. 57-34.00r.

Morton-Norwich Products, Inc.: *See—*
Alaimo, Robert J.; and Goldenberg, Marvin M., 3,856,803.
Alaimo, Robert J.; and Goldenberg, Marvin M., 3,856,804.
Wright, George C.; Burch, Homer A.; and Goldenberg, Marvin M., 3,856,825.

Mosiniak, Dennis G.: *See—*
Fowler, Susan M.; Gottfried, Carolyn Jobst; Mosiniak, Dennis G.; and Tenteris, Ansis U., 3,856,008.

Motion Mini Car Corporation: *See—*
Mitchell, William, 3,856,286.

Motoren- und Turbinen-Union Munchen GmbH: *See—*
Leibach, Heinrich, 3.856,239.

Motorola, Inc.: *See—*
Valek, Robert J., 3,855,983.

Mott, James D., to Hydril Company. Well apparatus for receiving and operating a through the bore receivable safety valve. 3,856,083, Cl. 166-224.000.

Moulton, Karl J.; and Beal, Robert E., to United States of America, Agriculture. Nickel/copper chromite catalysts for hydrogenating edible oils. 3,856,710, Cl. 252-470.000.

Mous, Gerarous Adrianus, to Cincinnati Milacron Inc. Proportional pulse generator. 3,857,026, Cl. 235-151.00h.

Movatex Products Ltd., mesne: *See—*
Van der Aa, Hendrik; and Van der Aa, Johan, 3,856,224.

MRT Magnet-Regeltechnik GmbH: *See—*
Hallman, Hermann; and Perkut, Branko, 3,855,827.

Mueller, Hans R.: *See—*
Closs, Felix H.; Mueller, Hans R.; and Wild, Daniel, 3,856,993.

Mueller, Karl J., to Xerox Corporation. Reproduction machine fuser. 3,856,462, Cl. 432-60.000.

Muench, Heinz, to Siemens Aktiengesellschaft. Multiple plug device. 3,856,375, Cl. 339-31.00r.

Mukerjee, Ambar Nath: *See—*
Klug, Helmut; and Mukerjee, Ambar Nath, 3,856,766.

Mulcahy, Harry W., to Amsted Industries, Incorporated. Snubbed railway truck bolster. 3,855,942, Cl. 105-197.0db.

Mulich, Stephen F.; Duffy, Donald R.; and Salter, Steven J., to MB Associates. Personnel distress signal. 3,855,930, Cl. 102-34.400.

Mulier, Pieter M. J.; and Jirak, Thomas L., to Medtronic, Inc. Pulse generator output regulator. 3,857,085, Cl. 323-22.00t.

Muller, Friedhelm, to Holstein & Kappert Maschinenfabrik "Phonix" GmbH. Bottle gripper for packing and unpacking machines. 3,856,343, Cl. 294-99.00r.

Muller, Johannes Jacobus; and Kock, Theodorus Joannes, to Lever Brothers Company. Interesterification catasysts consisting of an alkali metal dispersed in a neutralized and saturated fat. 3,856,703, Cl. 252-430.000.

Munters, Carl, AB: *See—*
Jonsson, Uno I., 3,855,719.

Murakami, Keiichi: *See—*
Susuki, Rinnosuke; Hoshi, Hiroshi; Saito, Jiro; Murakami, Keiichi; and Yamada, Hisashi, 3,856,746.

Murakami, Masahiro: *See—*
Takagi, Kazumi; Murakami, Masahiro; and Manabe, Kuniyoshi, 3,856,882.

Murao, Sawao; Meyers, Edward; and Parker, William Lawrence. Antibiotic EM-49. 3,856,938, Cl. 424-116.000.

Murase, Koichi: *See—*
Tateishi, Teizabro; Murase, Koichi; and Iwanaga, Yukio, 3,856,831.

Murata, Kikuzo: *See—*
Taninaka, Kuniaki; Shioyama, Osamu; and Murata, Kikuzo, 3,856,814.

Murata, Tadakazu: *See—*
Yokotani, Hajime; Miyamoto, Masuo; and Murata, Tadakazu, 3,856,911.

Murayama, Hajime: *See—*
Iwata, Tokushige; Sakamoto, Kiyoaki; Nawata, Teruo; Endo, Hiroyasu; Nakano, Masaru; and Murayama, Hajime, 3,856,478.

Murphy, Paul L. Appetite control composition. 3,856,942, Cl. 424-180.000.

Murphy, Thomas L.: *See—*
Harmon, James F.; Johnston, Richard D.; Lach, John H.; von der Lieth, William H.; and Murphy, Thomas L., 3,855,913.

Murton, Crawford B. Refractory lining for hot metallurgical ladles, soaking pits and furnaces. 3,856,538, Cl. 106-68.000.

Muthig, James Vincent: *See—*
Brandi, Adolph John; and Muthig, James Vincent, 3,855,778.

Myers Industries, Inc.: *See—*
Bartholomew, Allan E., 3,856,145.

Myers, John W., to Phillips Petroleum Company. Reforming process using Pt-Ir-Ga catalyst. 3,856,660, Cl. 208-138.000.

Myrenne, Karl-Dieter S.: *See—*
Hedman, Clarence L., Jr.; Myrenne, Karl-Dieter S.; and Vartanian, Perry H., Jr., 3,856,381.

Nabisco, Inc.: *See—*
Blanchard, Horace, 3,856,320.

Naeyaert, Roger S., Jr.: *See—*
Merlino, Eugene L., Jr.; Naeyaert, Roger S., Jr.; and Ellis, Jonas, 3,856,984.

Naftaly, Natan. Support and coupling for water sprinklers. 3,856,208, Cl. 239-251.000.

Nagai, Yoichiro; and Ojima, Iwao, to Sagami Chemical Research Center. Process for producing silylthioethers. 3,856,842, Cl. 260-488.20e.

Nagai, Yoichiro; and Ojima, Iwao, to Sagami Chemical Research Center. Process for producing silylether. 3,856,843, Cl. 260-448.80r.

Nagareda, Masazumi: *See—*
Nishio, Yasuhiro; Yamamoto, Yoshiriro; Okamoto, Zenichiro; Minami, Nagio; and Nagareda, Masazumi, 3,857,010.

Nagasawa, Taro; Hamada, Kozo; Yuguchi, Hiroya; and Mizuguchi, Kenji, to Morinaga Milk Industry Co., Ltd. Culture medium for bacteria. 3,856,627, Cl. 195-100.000.

Nakagome, Keisuke, to Nitto Electric Industrial Co., Ltd. Method of manufacturing composite films of heat resisting polymers. 3,856,559, Cl. 117-119.600.

Nakajima, Shigeo, to Taiheiyo Coal Mining Co., Ltd. Gate self-advancing support. 3,855,805, Cl. 61-45.00d.

Nakamoto, Hideo; Kobayashi, Juichi; and Kobayashi, Takashi, to Mitsubishi Rayon Company, Ltd. Photocurable composition containing polyvalent metal salts of unsaturated mono or dicarboxylic acids. 3,856,643, Cl. 204-159.150.

Nakamoto, Kikuo: *See*—
Sato, Ken; and Nakamoto, Kikuo, 3,856,686.

Nakanishi, Masaichi: *See*—
Maekawa, Hideyuki; and Nakanishi, Masaichi, 3,856,138.

Nakano, Masaru: *See*—
Iwata, Tokushige; Sakamoto, Kiyoaki; Nawata, Teruo; Endo, Hiroyasu; Nakano, Masaru; and Murayama, Hajime, 3,856,478.

Nakano, Seizo: *See*—
Daimon, Goro; Nakano, Seizo; and Kishi, Tuneo, 3,857,006.

Nakatani, Keiji: *See*—
Suzuki, Hidenori; Maeda, Katsumi; Nakatani, Keiji; and Ishii, Kenjiro, 3,856,397.

Nakayama, Ryo: *See*—
Hiraga, Kentaro; Yoshioka, Kouichi; Golo, Giichi; Nakayama, Ryo; and Masuoka, Michio, 3,856,829.

Nalco Chemical Company: *See*—
Frisque, Alvin J., 3,856,088.

Namikawa, Keishi: *See*—
Yashima, Saburo; Manabe, Haruo; Ito, Takuma; and Namikawa, Keishi, 3,856,666.

Nannichi, Kuninobu: *See*—
Kato, Satoru; Fukuda, Kouki; and Nannichi, Kuninobu, 3,856,488.

Napoli, Louis Sebastian; and Hughes, John Joseph, to RCA Corporation. Method for making beam lead device. 3,856,591, Cl. 156-3.000.

Narwid, Thomas Albert; and Uskokovic, Milan Radoje. Synthesis of 25-hydroxycholesterol and derivatives thereof. 3,856,780, Cl. 260-239.55r.

Natell, Richard W.: *See*—
Fisher, Edward; Rautio, Wilbur S.; Jankowiak, Roman; and Natell, Richard W., 3,856,983.

Nath, Dilip K., to General Electric Company. Preparation of rare-earth oxysulfide luminescent material. 3,856,698, Cl. 252-301.40s.

National Distillers and Chemical Corporation: *See*—
Biddell, William G., 3,856,890.

National Research Development Corporation: *See*—
Chick, Douglas Richard, 3,857,090.
Fleischmann, Martin; King, Christopher John Hall; Oldfield, John Wilfred; Plimley, Raymond Ernest; and Tennakoon, Charles Lionel Kasturiratne, 3,856,652.

Nawata, Teruo: *See*—
Iwata, Tokushige; Sakamoto, Kiyoaki; Nawata, Teruo; Endo, Hiroyasu; Nakano, Masaru; and Murayama, Hajime, 3,856,478.

Nedelec, Lucien; Guillaume, Jacques; and Allais, Andre, to Roussel-Uclaf. Novel thienobenzazepines as anti-depressants. 3,856,910, Cl. 424-275.000.

Nelson, Axel B.: *See*—
Filliung, Jacques J.; Nelson, Axel B.; and Billeter, Henry R., 3,855,640.

Nelson, Charles R. Stereo tape cartridge rack. 3,856,192, Cl. 224-42.10c.

Nelson, David A., to Dow Chemical Company, The. Plasticized vinyl chloride polymers containing alkyloxmethyl diphenyl oxides. 3,856,739, Cl. 260-33.20r.

Nelson, James: *See*—
Gibson, John; and Nelson, James, 3,855,871.

Nelson, Norman A.: *See*—
Garrett, Michael R.; Putch, Samuel W.; and Nelson, Norman A., 3,856,037.

Nelson, Ronald D.: *See*—
Allen, Richard P.; and Nelson, Ronald D., 3,856,579.

Nesbitt, John D.; Larson, Dennis H.; and Fejer, Mark E., to Leone International Sales Corporation, mesne. Glass melting furnace and process. 3,856,496, Cl. 65-29.000.

Nestleroth, Paul Lavern, to RCA Corporation. Electrode support strap. 3,857,058, Cl. 313-417.000.

Nett, Rudolph E., to United States of America, Army. Blind mating connector for missile sections. 3,855,934, Cl. 102-70.00r.

Netz, Otto: *See*—
Corte, Herbert; Heller, Harold; Lange, Michael; and Netz, Otto, 3,856,715.

Neumann, James W.; and Yielding, Douglas L., said Neumann assor. to TVI Marketing, Inc. Vapor induction system. 3,856,901, Cl. 261-18.00a.

Neunherz, Herbert W.; Bryant, Robert G.; and Flye, Donald R., to Gem Industries, Inc. High rise studio couch or bed. 3,855,650, Cl. 5-21.000.

Newby, Gordon L.: *See*—
Hutchison, Stanley O.; Anderson, Glenn W.; and Newby, Gordon L., 3,855,854.
Hutchison, Stanley O.; Anderson, Glenn W.; and Newby, Gordon L., 3,855,855.
Hutchison, Stanley O.; Anderson, Glenn W.; and Newby, Gordon L., 3,855,856.

Newby, Terrell B. Dispenser for liquids and solids with self-contained spout. 3,856,188, Cl. 222-535.000.

Newman, Seymour: *See*—
Dickie, Ray A.; and Newman, Seymour, 3,856,883.

Nicholson, Dana C. Couch. 3,855,652, Cl. 5-227.00r.

Nicholson, William Buford: *See*—
Tisdale, Benjamin Cornwall, III; and Nicholson, William Buford, 3,855,835.

Nieder, Berthold L.; and Tyson, David L. Lamination assembling apparatus. 3,855,685, Cl. 29-203.001.

Niesse, Paul Joseph, to Western Electric Company, Incorporated. Methods of and apparatus for joining materials. 3,857,013, Cl. 219-85.000.

Nihon Nohyaku Co., Ltd.: *See*—
Taninaka, Kuniaki; Shioyama, Osamu; and Murata, Kikuzo, 3,856,814.

Nikaido, Teruji; Haga, Kaoru; Sugiyama, Norio; and Fujiwara, Yasutaka, to Tokyo Denryoku Kabushiki Kaisha and Showa Densen Denran Kabushiki Kaisha. Bonding circuit for reducing sheath current of power cable line. 3,857,071, Cl. 317-44.000.

Nikka Kabushiki Kaisha: *See*—
Saito, Shiro, 3,855,968.

Nikles, Erwin; Dittrich, Volker; and Pinter, Ladislaus, to Ciba-Geigy AG. Phenyl carbamates. 3,856,816, Cl. 260-338.000.

Nikles, Erwin; Dittrich, Volker; and Pinter, Ladislaus, to Ciba-Geigy AG. Carbamates and their use as pesticides. 3,856,968, Cl. 424-276.000.

Niles, Earl Thomas: *See*—
Jankowiak, Erwin M.; Niles, Earl Thomas; and Lane, George A., 3,856,933.

Nilles, Paul Emile, to Eisenwerke-Gesellschaft Maximilianshutte m.b.H. Pig iron refining process. 3,856,510, Cl. 75-60.000.

Nilsen, Tor Noldus. Pressing means for use in glueing construction panels to a base. 3,856,291, Cl. 269-22.000.

Nilsson, Per, to AB Welin. Ships accomodation ladder. 3,856,110, Cl. 182-84.000.

Nippon Carbon Company Limited: *See*—
Sato, Ken; and Nakamoto, Kikuo, 3,856,686.

Nippon Mining Co., Ltd., mesne: *See*—
Yashima, Saburo; Manabe, Haruo; Ito, Takuma; and Namikawa, Keishi, 3,856,666.

Nippon Oil Co., Ltd.: *See*—
Otsuki, Yutaka; Imai, Hirosuke; Kaiya, Atsushi; and Horii, Hideo, 3,856,877.

Nippon Petrochemicals Co. Ltd.: *See*—
Takahashi, Naoya; Aida, Yoshiaki; and Shimizu, Isoo, 3,856,740.

Nippon Selfoc Kabushiki Kaisha; a/k/a Nippon Selfoc Co., Ltd.: *See*—
Kitano, Ichiro; and Ikeda, Yoshiro, 3,856,494.

Nippon Soda Company, Limited: *See*—
Kohmoto, Keisuke; and Miyazaki, Koshin, 3,856,847.

Nippon Steel Corporation: *See*—
Tanaka, Osamu; Yamamoto, Takaaki; and Takata, Toshihiko, 3,856,568.

Nischk, Gunther: *See*—
Bodesheim, Ferdinand; Radlmann, Eduard; Schaffner, Heinz; and Nischk, Gunther, 3,856,738.

Nishimura, Izuhiko; and Ogata, Toshiaki, to Kabushiki Kaisha Suwa Seikosha. Time-correcting device for electronic timepieces. 3,855,782, Cl. 58-23.00r.

Nishino, Atsushi; Kumano, Hiroshi; and Iura, Yukihide, to Matsushita Electric Industrial Company, Limited. Apparatus for producing mineral water. 3,855,914, Cl. 99-275.000.

Nishio, Minoru; and Sagawa, Norio, to Matsushita Electric Works, Ltd. Microswitch. 3,857,003, Cl. 200-67.0db.

Nishio, Yasuhiro; Yamamoto, Yoshiriro; Okamoto, Zenichiro; Minami, Nagio; and Nagareda, Masazumi, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for welding multi-layer laminated work pieces. 3,857,010, Cl. 219-61.000.

Nissan Motor Company, Limited: *See*—
Ishimaru, Wataru; and Miyauchi, Toshiyuki, 3,855,880.
Itoh, Takane, 3,856,034.
Kakizaki, Tadao; Ichimaru, Yoshiro; and Arai, Ryozo, 3,856,195.
Kato, Tadanari; Ikemi, Tadashi; Ooishi, Tutomu; Sano, Mitsuyoshi; Hayashida, Kengo; and Matsumoto, Chinami, 3,856,707.
Koizumi, Toshihiro, 3,856,328.
Masaki, Kenji; and Etoo, Yukihiro, 3,855,975.
Otani, Syuichi, 3,856,327.
Saitoh, Shigeru, 3,856,324.
Usui, Keizaburo; Abe, Eiichi; and Hayama, Isao, 3,856,121.

Nitto Electric Industrial Co., Ltd.: *See*—
Nakagome, Keisuke, 3,856,559.

Nitto Kasei Co., Ltd.: *See*—
Seki, Toshio; Suzuki, Kazaburo; and Matsuzaki, Takashi, 3,856,727.

Niv, Meir: *See*—
Halfon, Uri; and Niv, Meir, 3,856,127.

NJM, Inc.: *See*—
Faltot, Maurice J.; and Voltmer, Helmut, 3,856,607.

NL Industries, Inc.: *See*—
Bauer, Alfred F., 3,856,183.
Weiss, Gerald L., 3,856,546.

Nobel, Fred I.: *See*—
Kessler, Richard B.; and Nobel, Fred I., 3,856,637.

Noble, Jack E.; Riggle, Peter; Emigh, Stuart G.; and Martini, William R., to United States of America, Health, Education, and Welfare, mesne. Heat engine. 3,855,795, Cl. 60-524.000.

Noble, Milton L.; and Snowman, Lawrence R., to General Electric Company. Heterodyne laser absorption spectrometer. 3,856,406, Cl. 356-106.00s.

Nodine, John H.; Waite, John Herbert; Waite, Herbert; and Fletcher, Martin J., to Bio-Digital Sciences, Inc. Method of screening tissue specimens for diagnostic examination. 3,856,930, Cl. 424-11.000.

Nogler, Walter, to Gebruder Kollensperger. Support pole. 3,856,421, Cl. 403-118.000.

Noguchi, Toshiaki: *See—*
Miyamoto, Akira; Akiyama, Hiroyuki; Noguchi, Toshiaki; and Ohtsuka, Isao, 3,856,719.

Nolan, John T., Jr.: *See—*
O'Connor, James J.; and Nolan, John T., Jr., 3,856,724.

Nolfi, Luigi Mari: *See—*
Hidalgo-Briceno, Miguel, 3,855,998.

Nomine, Gerard: *See—*
Allais, Andre; Lilas, Les; and Nomine, Gerard, 3,856,967.

Nordin, Karl Tore, to Lidkopings Mekaniska Verkstads Aktiebolag. Sharpening device for grinding wheels. 3,855,992, Cl. 125-11.0cd.

Norgaard, Arthur J., to General Box Company. Insulated shipping container. 3,856,178, Cl. 220-23.830.

Norman, Earl P., Jr.: *See—*
Fox, James D.; Norman, Earl P., Jr.; and Sansbury, Jerry F., 3,856,179.

Norman, John D.: *See—*
Harmon, Gardy R.; Norman, John D.; and Tadlock, Guy M., 3,856,218.

Norskog, James, to General Telephone Company of California. Wire wrap qualification test fixture. 3,855,850, Cl. 73-88.00b.

North, Terance Washford. Process for preparing 1,1'-peroxydicyclohexylamine. 3,856,923, Cl. 260-307.00f.

Norwood, David W., to Concorde Fibers, Inc. Spinneret with yarn separator. 3,856,445, Cl. 425-71.000.

Notaras, Angelo Lambrinos: *See—*
Notaras, John Arthur; and Notaras, Angelo Lambrinos, 3,855,976.

Notaras, John Arthur; and Notaras, Angelo Lambrinos. Apparatus for controlling the quality of the combustion air of an engine. 3,855,976, Cl. 123-41.620.

Nouveau Products Corporation: *See—*
Miller, Julius, 3,856,251.

Novak, Arthur H. Method of and apparatus for manufacturing integral finned tubing. 3,855,832, Cl. 72-84.000.

Novak, William P. Encapsulated scintillation phosphor. 3,857,036, Cl. 250-367.000.

Noveroske, Robert L., to Dow Chemical Company, The. Method for the stimulation of plant growth. 3,856,502, Cl. 71-77.000.

Nowak, Herbert: *See—*
Dahm, Johann; Borck, Joachim; Nowak, Herbert; Simane, Zdenek; and Kayser, Detlev, 3,856,812.

Nozaki, Kenzie, to Shell Oil Company. Production of carboxylic acids and esters. 3,856,856, Cl. 260-532.000.

NSM Apparatebau GmbH Kommanditgesellschaft: *See—*
Menke, Wilhelm, 3,856,126.

O'Brien, Joseph L.; and Derby, Richard, to Rohm and Haas Company. Organo tin heterocyclic compounds. 3,856,840, Cl. 260-429.700.

Occidental Petroleum Corporation: *See—*
Peterson, Willard D., 3,856,670.

O'Connor, James J.; and Nolan, John T., Jr., to Texaco Inc. Reinforced thermoplastic compositions. 3,856,724, Cl. 260-17.4cl.

Oda, Yasuhiro: *See—*
Kolshi, Hitoshi; Takao, Michio; Oda, Yasuhiro; Iguchi, Hideo; and Kohase, Shigeru, 3,856,759.

Oertel, Gunter: *See—*
Wagner, Kuno; Oertel, Gunter; Golitz, Hans Dietrich; and Quiring, Bernd, 3,856,756.

Ogata, Toshiaki: *See—*
Nishimura, Izuhiko; and Ogata, Toshiaki, 3,855,782.

Ogawa, Masaya: *See—*
Kushima, Teizo; Tanaka, Susumu; and Ogawa, Masaya, 3,856,396.

Ogawa, Tadaharu; Yasui, Hiroshi; and Kaji, Shigeo. Process for obtaining nickel concentrates from nickel oxide ores. 3,856,505, Cl. 75-3.000.

Ogden, Kenneth Whittier: *See—*
Major, Peter Colin; and Ogden, Kenneth Whittier, 3,857,063.

Ogihara, Masuo; and Watanabe, Masanori, to Seiko Koki Kabushiki Kaisha. Opening device for an electronic shutter. 3,856,393, Cl. 354-258.000.

Oglebay Norton Company: *See—*
Dowidchuk, George; and Stockman, James R., 3,856,258.

Ohba, Shunjiro. Sequential control circuit for a remote-controlled vehicle. 3,856,104, Cl. 180-98.000.

Ohchi, Kazuo: *See—*
Yoshizawa, Toshio; Yamada, Yasuo; Taniguchi, Toshinori; Kose, Tatsuo; Ohchi, Kazuo; and Hori, Kiyokazu, 3,855,771.

Ohtsuka, Isao: *See—*
Miyamoto, Akira; Akiyama, Hiroyuki; Noguchi, Toshiaki; and Ohtsuka, Isao, 3,856,719.

Ojima, Iwao: *See—*
Nagai, Yoichiro; and Ojima, Iwao, 3,856,842.
Nagai, Yoichiro; and Ojima, Iwao, 3,856,843.

Okami, Yoshiro: *See—*
Umezawa, Hamao; Okami, Yoshiro; Takeuchi, Tomio; and Ishiyama, Tetsuji, 3,856,969.

Okamoto, Zenichiro: *See—*
Nishio, Yasuhiro; Yamamoto, Yoshiriro; Okamoto, Zenichiro; Minami, Nagio; and Nagareda, Masazumi, 3,857,010.

Oki, Toshihiko; Kurita, Hirohisa; and Fujimori, Motoyuki, to Kibushiki Kaisha Suwa Seikosha. Electrochemical cell support and contact structure. 3,856,577, Cl. 136-171.000.

Okutsu, Masaru: *See—*
Ishido, Yoshiharu; Yoshino, Teruo; Komura, Hajime; Suzuki, Katsumi; Yamasaki, Akihiro; and Okutsu, Masaru, 3,856,777.

Oldfield, John Wilfred: *See—*
Fleischmann, Martin; King, Christopher John Hall; Oldfield, John Wilfred; Plimley, Raymond Ernest; and Tennakoon, Charles Lionel Kasturiratne, 3,856,652.

Olinick, Robert F., to Jentzen-Miller Company, The. Convertible gondola display for stores. 3,856,148, Cl. 211-148.000.

Olsen, Leslie E. Battery operated lamp. 3,857,028, Cl. 240-10.630.

Olson, David H.: *See—*
Haag, Werner O.; and Olson, David H., 3,856,871.

Olszowka, Robert F.: *See—*
Thomas, Howard M.; and Olszowka, Robert F., 3,855,894.

Oltmann, Fay W., to Souvenir Incorporated. Extended-life pen. 3,856,420, Cl. 401-109.000.

Omura, Etuzou; Minami, Toshio; and Kusunose, Tetsuhiro, to Asahi Kasei Kogyo Kabushiki Kaisha. Synthetic thermoplastic multifilament yarns. 3,855,776, Cl. 57-153.000.

Ono, Takayuki: *See—*
Yamaguchi, Tadashi; Ono, Takayuki; Hoshi, Hiroshi; Hirakawa, Michio; and Watanabe, Isao, 3,856,745.

Ontario Research Foundation: *See—*
Pilliar, Robert M., 3,855,638.

Onuki, Akio: *See—*
Maeda, Moriichi; Onuki, Akio; and Kusano, Kazuya, 3,856,914.

Ooba, Shigehiro: *See—*
Fujimoto, Keimei; Hirano, Masachika; Takeda, Hisami; and Ooba, Shigehiro, 3,856,972.

Ooishi, Tutomu: *See—*
Kato, Tadanari; Ikemi, Tadashi; Ooishi, Tutomu; Sano, Mitsuyoshi; Hayashida, Kengo; and Matsumoto, Chinami, 3,856,707.

Oouchi, Teruo: *See—*
Takahashi, Nagashige; and Oouchi, Teruo, 3,855,897.

Oppenheim, Rudolf: *See—*
Brandis, Helmut; Oppenheim, Rudolf; Lennartz, Gustav; and Kiesheyer, Heinrich, 3,856,515.

Optel Corporation: *See—*
Luce, Nunzio A., 3,855,783.

Opti-Holding AG: *See—*
Heimberger, Helmut, 3,855,673.

Orban, Jean: *See—*
Vital, Zoltan; and Orban, Jean, 3,857,064.

Ordorica, Miguel A., to Mather Company, The. Sensing arm for control unit between articulated vehicles. 3,856,329, Cl. 280-432.000.

O'Rork, Charles T., Jr.: *See—*
Forkner, Claude E.; and O'Rork, Charles T., Jr., 3,855,765.

Osborn, Ray: *See—*
Grimme, Henry L., Jr.; and Osborn, Ray, 3,856,676.

Osburn, Michael R.: *See—*
Parker, Leland L.; Jones, Jerry O.; and Osburn, Michael R., 3,855,932.

Otani, Syuichi, to Nissan Motor Company, Limited. Safety seat belt for motor vehicle. 3,856,327, Cl. 280-150.0sb.

Othmer, Donald F. Method for producing aluminum chloride, aluminum metal, and iron directly from ores. 3,856,508, Cl. 75-29.000.

Otis Elevator Company: *See—*
Sobey, Albert J.; McQueen, Norman; and Larsen, Robert R., 3,856,106.

Otis Engineering Corporation: *See—*
Canalizo, Carlos R., 3,856,081.

Otsuki, Yutaka; Imai, Hirosuke; Kaiya, Atsushi; and Horii, Hideo, to Nippon Oil Co., Ltd. Method for isomerization of lower polymers of butadiene. 3,856,877, Cl. 260-677.00r.

Ottaway, Herbert J. Engine powered jumping stick. 3,855,979, Cl. 123-47.00a.

Otway, Clifford G.; and Biden, Barry D. Method and apparatus for mixing and turbulating particulate fuel with air for subsequent combustion. 3,856,455, Cl. 431-11.000.

Outers Laboratories, Inc.: *See—*
Christen, Jack P., 3,856,374.

Owen, Harley, to Mobil Oil Corporation. Multiple reactor FCC system relying upon a dual cracking catalyst composition. 3,856,659, Cl. 208-80.000.

Owen, Richard A.: *See—*
Mallow, William A.; Owen, Richard A.; and Baker, Ethelbert J., Jr., 3,856,539.

Owens-Corning Fiberglas Corporation: *See—*
Hurley, Raymond E., 3,855,774.
Schroeder, Charles F., 3,855,678.

Owens-Illinois, Inc.: *See—*
Brug, James E.; and Heidelberg, Eric X., 3,856,507.
Schmid, Anthony P., 3,856,979.
Sweeney, Roy P.; and Shull, Robert W., 3,855,756.

Oxford Laboratories, Inc.: *See—*

Roach, William J., 3,855,867.
Oxley, Peter; and Housley, John Rosindale, to Boots Pure Drug Company Limited. 17-Acyloxysteroids and their manufacture. 3,856,956, Cl. 424-243.000.
Oxy Metal Finishing Corporation: *See*—
Becking, Donald H., 3,856,694.
Brown, Henry, 3,856,635.
Ozechoski, Anthony T., to Basic, Inc. Key telephone unit line card. 3,856,994, Cl. 179-99.000.
Pacific Resins & Chemicals, Inc.: *See*—
Scott, James E., Jr.; and Woodward, Ernest Ray, 3,856,616.
Pagnozzi, L. Rita; Kim, Tai K.; Laferty, John M.; and MacInnis, Martin B., to GTE Sylvania Incorporated. Solvent recycle process for recovery of rhenium from molybdate solutions. 3,856,915, Cl. 423-49.000.
Palmer, Joseph; and Handfield, Guy, to Centre de Recherche Industrielle du Quebec Sanite-Foy. Processing titaniferous iron ores for the recovery of aluminum, chromium, iron, titanium and vanadium. 3,856,512, Cl. 75-101.00r.
Palmer, Thomas W., III: *See*—
Campagna, Edward R.; Hardy, Donald F.; Palmer, Thomas W., III; Daugherty, Barney R.; and Letawa, John R., 3,856,498.
Paltier Corporation, The: *See*—
Skubic, Leroy F.; and Blozis, Peter P., 3,855,944.
Panas, Walter, to Wheaton Industries. Universal chucking mechanism. 3,855,966, Cl. 118-66.000.
Pannell, Robert T. Compost processing machine. 3,856,276, Cl. 259-183.000.
Papa, Anthony Joseph; Proops, William Robert; and Shields, Theodore Curtis, to Union Carbide Corporation. Tetrabromo ether diol flame-retardant. 3,856,865, Cl. 260-615.00r.
Paper Novelty Manufacturing Co.: *See*—
Maas, Fred L., 3,856,609.
Papiau, Guy, to Societe Anonyme D.E.A. Hydraulic master cylinder. 3,855,797, Cl. 60-547.000.
Papoi, Michael S.; and Barritt, Max E., to Progressive Dynamics, Inc. Combination power converter-distribution panel unit for recreational vehicles. 3,857,044, Cl. 307-9.000.
Parker, Leland L.; Jones, Jerry O.; and Osburn, Michael R., to United States of America, Navy. Expelling charge ignition system. 3,855,932, Cl. 102-49.500.
Parker, William Lawrence: *See*—
Murao, Sawao; Meyers, Edward; and Parker, William Lawrence, 3,856,938.
Parr, Erwin W. Dual flow fluid filter. 3,856,683, Cl. 210-336.000.
Parrett, John T.; and Frazer, David S., to Hoehring Company. Outrigger hydraulic system. 3,856,152, Cl. 212-145.000.
Parsons, Carolyn J.; and Parsons, Stoner. Adjustable mounting for work-objects and the like. 3,855,718, Cl. 38-102.200.
Parsons, Roger C., to Continental Oil Company. Blend borehole backreaming method. 3,856,084, Cl. 166-257.000.
Parsons, Stoner: *See*—
Parsons, Carolyn J.; and Parsons, Stoner, 3,855,718.
Patel, Kiritkumar R.: *See*—
Mack, Raymond E.; Patel, Kiritkumar R.; and Crist, Edward C., 3,856,124.
Patents and Developments A/S: *See*—
Dahl, Carsten, 3,856,078.
Patheiger, Manfred: *See*—
Traenckner, Hans-Joachim; Rudolph, Hans; Rosenkranz, Hans Jurgen; Fuhr, Karl; and Patheiger, Manfred, 3,856,644.
Patterson, Merle W.; and Caves, Lawrence C., Jr., to Merit Systems, Inc. Earth anchor. 3,855,745, Cl. 52-159.000.
Paul, George T. Irrigation pipe walker. 3,856,038, Cl. 137-344.000.
Paul, William F., Sr. Tamper-proof time interval recording system. 3,855,851, Cl. 73-115.000.
Paulmar Incorporated: *See*—
Menary, Robert F., 3,856,414.
Pawlak, Raymond M.: *See*—
Siegelman, Abe; Quoss, Robert N.; and Pawlak, Raymond M., 3,856,536.
Paxton, Michael M.: *See*—
Bates, John F.; Holmes, James J.; Paxton, Michael M.; and Straalsund, Jerry L., 3,856,517.
Payne, Calvin L., Jr.; Gambello, Vincent J.; and Molnar, John A., to Tudor Games, Incorporated. Basketball game. 3,856,303, Cl. 273-85.00b.
Payne, David. Ball tossing device. 3,856,300, Cl. 273-25.000.
Payne, Richard Steven; and Scavuzzo, Robert John, to Bell Telephone Laboratories, Incorporated. Bipolar transistors and method of manufacture. 3,856,578, Cl. 148-1.500.
Pearl, David R.; and Robinson, Samuel Clifford, to Gerber Garment Technology, Inc. Method for cutting pattern pieces from sheet material. 3,855,887, Cl. 83-49.000.
Peche, Gerhard, to Siemens Aktiengesellschaft. Vacuum switch assembly. 3,857,005, Cl. 200-144.00b.
Pedersen, Charles J., to Du Pont de Nemours, E. I., and Company. Macrocyclic sulfides. 3,856,813, Cl. 260-327.00b.
Pegg, Ronald L., to Haveg Industries, Inc. Expanded porous substrate for fibrous graphite structure. 3,856,593, Cl. 156-60.000.
Peit, Joseph G.: *See*—
McMann, Renville H.; and Peit, Joseph G., 3,856,987.
Pennwalt Corporation: *See*—
Huber, Ludwig Konrad, 3,856,786.
Huber, Ludwig Konrad, 3,856,952.
Van den Boogaart, Krijn; and Louis, Meelis Nicolaus, 3,856,836.
Pera, John D.: *See*—
Buckman, John D.; and Pera, John D., 3,856,851.
Perez, Manuel, to Aerosols Control Corporation. Gas scrubber. 3,856,487, Cl. 55-223.000.
Perisse, Jean Maurice Francois: *See*—
Perisse, Pierre; Perisse, Jean Maurice Francois; and Chancholle, Andre Robert, 3,856,017.
Perisse, Pierre; Perisse, Jean Maurice Francois; and Chancholle, Andre Robert, 3,856,018.
Perisse, Pierre; Perisse, Jean Maurice Francois; and Chancholle, Andre Robert. Apparatus for ligating sectioned blood vessels. 3,856,017, Cl. 128-326.000.
Perisse, Pierre; Perisse, Jean Maurice Francois; and Chancholle, Andre Robert. Process for ligating sectioned blood vessels. 3,856,018, Cl. 128-326.000.
Perkut, Branko: *See*—
Hallman, Hermann; and Perkut, Branko, 3,855,827.
Perronnet, Jacques; and Girault, Pierre, to Roussel-UCLAF. Fungicidal use of 3,4-dibromobutyronitrile. 3,856,974, Cl. 424-304.000.
Perrot, Friedrich: *See*—
Giger, Urs; and Perrot, Friedrich, 3,855,779.
Persons-Majestic Mfg. Company: *See*—
Bird, Martin J., 3,856,348.
Peter, Klaus-Dieter, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Method and apparatus for producing a distillate. 3,856,632, Cl. 203-11.000.
Peters, Beldon A.; Smith, Louis P.; and Landrum, Aubrey O., to Esso Production Research Company. Proportional chemical injection system. 3,856,677, Cl. 210-96.000.
Peters, Karl-Heinz: *See*—
Heynert, Gerhard; and Peters, Karl-Heinz, 3,856,509.
Peters, Russel: *See*—
Helbing, Clarence R.; Peters, Russel; and Cooper, Hugh E., 3,855,764.
Petersen, Howard L.: *See*—
Unites States of America, National Aeronautics and Space Administration, 3,857,045.
Peterson, Frank Clyde: *See*—
Theard, Leslie Peter; Peterson, Frank Clyde; Russell, John Lynn, Jr.; and Reierson, Robert L., 3,856,717.
Peterson, Willard D., to Occidental Petroleum Corporation. Removal of boron from water. 3,856,670, Cl. 210-32.000.
Petigara, Ramesh B.: *See*—
Yale, Harry Louis; and Petigara, Ramesh B., 3,856,781.
Yale, Harry Louis; and Petigara, Ramesh B., 3,856,782.
Yale, Harry Louis; and Petigara, Ramesh B., 3,856,801.
Petocz, Lujza: *See*—
Rakoczi, Jozsef; Beck, Ivan; Komlos, Endre; Petocz, Lujza; and Grasser, Katalin, 3,856,778.
Petro-Tex Chemical Corporation: *See*—
Manning, Harold E., 3,856,881.
Woskow, Marvin Z.; and Christmann, Harold F., 3,856,880.
Petrukhno, Anatoly Semenovich: *See*—
Grechanichenko, Grigory Mikhailovich; Gusinsky, Evgeny Savelievich; Petrukhao, Anatoly Semenovich; and Dobrovolsky, Evgeny Vladimirovich, 3,856,481.
Petrusek, Victor. Target, indicator and tethered projectile. 3,856,306, Cl. 273-98.000.
Pettersson, Carl Bruno. Pump unit for the transportation of liquids. 3,856,429, Cl. 415-53.000.
Peveraro, Cesare, to Societa' Per La Strada Guidata S. R. L. Switches or points for tracks for vehicles. 3,855,938, Cl. 104-130.000.
Pfeiffer, Hans Walter: *See*—
Bernold, Jean P., 3,855,801.
Pfizer Inc.: *See*—
Danilewicz, John Christopher; Kemp, John Edward Glyn; Snarey, Michael; and Wright, James Robert, 3,856,794.
Kuhla, Donald E.; Sarges, Reinhard; and Wiedermann, Hans E., 3,856,806.
Pfluger, Harold P. Self adjusting pulley mount for traction device. 3,856,003, Cl. 128-75.000.
Philipp, Erich, to Ford Motor Company. Method of correcting eccentricity and running out of true in stamped steel wheels. 3,855,683, Cl. 29-159.010.
Philipp, Erich, to Ford Motor Company. Machine for correcting eccentricity and running out of true in stamped steel wheels. 3,855,837, Cl. 72-354.000.
Phillipps, Gordon Hanley; May, Peter John; McDonald, Brian; and Woollett, Edward Arthur, to Glaxo Laboratories, Limited. Anti-inflammatory steriods of the androstane series having a halo-substituted C_1-C_2 alkoxy carbonyl group at the 17β position. 3,856,828, Cl. 260-397.100.
Phillips Fiber Corporation: *See*—
Stegelman, Albert F.; and Michalski, Arnold, 3,857,012.
Phillips Fibers Corporation: *See*—
Davis, James L., 3,855,773.
Phillips, Otto C. Laryngoscope blade. 3,856,001, Cl. 128-11.000.
Phillips Petroleum Company: *See*—
Bertus, Brent J.; and Walker, Darrell W., 3,856,879.
Blackwell, Jennings P., 3,856,560.
Blackwell, Jennings P., 3,856,735.
Bresson, Clarence R.; and Spaulding, Forrest D., 3,856,732.
Chapman, Charles C., 3,856,629.
Fahey, Darryl R., 3,856,868.

Guillory, Jack P.; and Mathis, Ronald D., 3,856,750.
Hitzman, Donald O., 3,856,774.
Myers, John W., 3,856,660.
Smith, Ernest L., 3,856,314.
Tieszen, Dale O.; and Edmonds, James T., Jr., 3,856,736.

Photoidetics, Inc.: *See—*
Harrison, William J., 3,856,392.

Phys-Chemical Research Corporation: *See—*
Hershler, Abe, 3,856,404.

Pickard, Frank W., 10% to stanford, Eleanor D. J. Bicycle lock. 3,855,825, Cl. 70-14.000.

Picker, Patrick, to Universite de Sherbrooke. Cumulative thermal detector. 3,856,467, Cl. 23-230.00r.

Piepoli, Francesco: *See—*
Montesissa, Giorgio; and Piepoli, Francesco, 3,856,725.

Pignocco, Arthur J.: *See—*
Adams, Richard C.; Kachik, Robert H.; Pignocco, Arthur J.; and Rall, Waldo, 3,856,076.

Pilliar, Robert M., to Ontario Research Foundation. Surgical prosthetic device with porous metal coating. 3,855,638, Cl. 3-1.000.

Pilloff, Herschel S., to United States of America, Navy. Longitudinally-pumped two-wavelength lasers. 3,857,109, Cl. 331-94.500.

Pinter, Ladislaus: *See—*
Nikles, Erwin; Dittrich, Volker; and Pinter, Ladislaus, 3,856,816.
Nikles, Erwin; Dittrich, Volker; and Pinter, Ladislaus, 3,856,968.

Piretti, Giancarlo, to Anonima Castelli S.A.S. Structural components for the composition of disassemblable pieces of furniture. 3,856,147, Cl. 211-148.000.

Pitha, John J.; and Ellis, Howard F. Electrode for porous ceramic and method of making same. 3,856,567, Cl. 117-221.000.

Pittman, Tobe A.; and Woods, Jack L. Bitumen extraction apparatus including endless perforate conveyor and plural solvent-spray means. 3,856,474, Cl. 23-267.00r.

Pivacek, William J., to Invacare Corporation. Storable bed rail. 3,855,654, Cl. 5-331.000.

Platzek, Harold M., to United States of America, Navy. Explosive coupling assembly. 3,855,789, Cl. 60-225.000.

Plimley, Raymond Ernest: *See—*
Fleischmann, Martin; King, Christopher John Hall; Oldfield, John Wilfred; Plimley, Raymond Ernest; and Tennakoon, Charles Lionel Kasturiratne, 3,856,652.

Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber Colombes: *See—*
Ganzinotti, Jean-Victor, 3,855,800.

Pohl, Harold J., to Kellwood Company. Pack frame. 3,856,191, Cl. 224-24.00a.

Pohlenz, Elmer E., to Aluminum Company of America. Method and apparatus for closing and/or sealing receptacles. 3,855,759, Cl. 53-342.000.

Polaroid Corporation: *See—*
Bilofsky, Ruth C.; and Rogers, Howard G., 3,856,521.
Bloom, Stanley M.; and Green, Milton, 3,856,520.
George, Louis J.; and Sahatjian, Ronald A., 3,856,522.
Moore, Phylis T.; and Simon, Myron S., 3,856,714.
Stella, Joseph A., 3,856,390.
Wray, William R.; and Stella, Joseph A., 3,856,387.

Poliak, John M.; Weitzman, Milton J.; and Lopez, Juan M., to Leviton Manufacturing Co., Inc. Electrical connector. 3,856,376, Cl. 339-107.000.

Politechnika Warszawska: *See—*
Brzozowski, Zbigniew K.; Porejko, Stanislaw; Kaczorowski, Janusz; and Kielkiewicz, Jedrzej, 3,856,556.

Polk, Donald E.: *See—*
Chen, Ho-Sou; and Polk, Donald E., 3,856,513.

Pollman, Frederic W.; Reynolds, David W.; Ross, William A.; and Schauer, George A., to Sundstrand Corporation. Transmission ratio control system. 3,855,793, Cl. 60-431.000.

Pollock, Charles B.; Scott, James L.; and Leitnaker, James M., to United States of America, Atomic Energy Commission. High temperature nuclear reactor fuel. 3,856,622, Cl. 176-68.000.

Polyprodukte, AG: *See—*
Hirmann, Georg, 3,855,709.

Ponder & Best, Inc.: *See—*
Vital, Zoltan; and Orban, Jean, 3,857,064.

Porejko, Stanislaw: *See—*
Brzozowski, Zbigniew K.; Porejko, Stanislaw; Kaczorowski, Janusz; and Kielkiewicz, Jedrzej, 3,856,556.

Porta, Paolo Della; Cataluppi, Angelo; Ferrario, Bruno; and Montalenti, Paolo, to S.A.E.S. Getters S.p.A. Coating a substrate with soft particles. 3,856,709, Cl. 252-463.000.

Porter, John Norman: *See—*
Ellestad, George Alfred; Martin, John Henry Edward James; and Porter, John Norman, 3,856,939.

Porter, Wallace M., Jr., to TRW Inc. Gaging method and apparatus. 3,855,736, Cl. 51-165.750.

Portouw, Robert C., to Drew Engineering Co. Hood for dryer. 3,855,713, Cl. 34-122.000.

Post, Donald Saxton, to Xerox Corporation. Printing machine with operation lockout. 3,856,125, Cl. 192-127.000.

Posternak, Theodore: *See—*
Cehovic, Georges; Gabbai, Albert; Marcus, Ilan; and Posternak, Theodore, 3,856,776.

Potter, Richard W., to McGraw Edison Company. Control system for a compacting machine. 3,855,919, Cl. 100-52.000.

Powers, Raymond P.: *See—*
Seifert, Lester H.; Powers, Raymond P.; Schmidt, William M.; Thorwaldsen, Stanley E.; Smith, Frederick W.; McElroy, David C.; and Dunton, Roy P., 3,855,763.

PPG Industries, Inc.: *See—*
Cox, Donald E., 3,856,500.
Frank, Robert G., 3,856,499.
Hummel, Merritt J., 3,856,497.
Raetzsch, Carl W.; and Cunningham, Hugh, 3,856,651.

Prange, Horst, to Con-Technik GmbH, mesne. Wiping and washing device for glass surfaces, those of vehicles in particular. 3,855,663, Cl. 15-250.040.

Precision Fukuhara Works, Ltd.: *See—*
Sawazaki, Masatoshi, 3,855,819.

Preiss, Peter: *See—*
Schnurrbusch, Karl; and Preiss, Peter, 3,856,533.

Preissinger, Karl-Heinz: *See—*
Heywang, Hermann; Kobale, Manfred; Preissinger, Karl-Heinz; Ristow, Dietrich; and Wehnelt, Ulrich, 3,857,074.

Price, Peter Michael Myatt: *See—*
Mitchie, Robert Edward; and Price, Peter Michael Myatt, 3,857,095.

Price, Richard J. Radio navigation plotter. 3,855,706, Cl. 33-1.0sd.

Prieto, Martin Angel, to Kerr-McGee Chemical Corporation. Process of treating electrolytic manganese dioxide. 3,856,576, Cl. 136-139.000.

Prince, Lawrence R. Automotive rear view cleaning device. 3,855,661, Cl. 15-250.010.

Prince Manufacturing, Inc.: *See—*
Sweeton, David C., 3,855,988.

Principe, Pacifico A.: *See—*
Stiller, Eric T.; Levine, Seymour D.; Principe, Pacifico A.; and Diassi, Patrick A., 3,856,977.

Procter & Gamble Company, The: *See—*
Atkinson, Ronald Edward, 3,856,684.
Dulle, Bernard A., 3,856,013.
Wahlert, Stanely D., 3,856,665.

Progressive Dynamics, Inc.: *See—*
Papoi, Michael S.; and Barritt, Max E., 3,857,044.

Proops, William Robert: *See—*
Papa, Anthony Joseph; Proops, William Robert; and Shields, Theodore Curtis, 3,856,865.

Propst, Robert L., to Miller, Herman, Inc. Self-making bed. 3,855,655, Cl. 5-317.00r.

Prosecky, Jaroslav; and Srda, Lubomir. Apparatus for continuously chamoising halves. 3,855,823, Cl. 69-32.000.

Prudkovsky, Garald Petrovich; Khotina, Alexandra Vasilievna; Sushkin, Nikolai Gavrilovich; Kopnev, Lev Nikolaevich; and Merzlikin, Sergei Filippovich. Electron beam generator. 3,857,014, Cl. 219-121.0eb.

Puckett, Howard N.: *See—*
Brown, Hart; and Puckett, Howard N., 3,856,046.

Puckette, Charles McD.; and Butler, Walter J., to General Electric Company. Variable burst length waveform generator. 3,857,101, Cl. 328-72.000.

Puckowski, Robert Tadeusz; Hagger, John Michael Richards; and Elder, Keith Robert McMillan, to British Insulated Callender's Cables Limited. Telecommunication cables. 3,856,980, Cl. 174-23.00c.

Putch, Samuel W.: *See—*
Garrett, Michael R.; Putch, Samuel W.; and Nelson, Norman A., 3,856,037.

Quantz, Norman G., to Lectron Products Inc. Lock release with alarm switch mounting means. 3,857,001, Cl. 200-61.640.

Quarch, Rolf: *See—*
Geiss, Richard; and Quarch, Rolf, 3,856,695.

Queen, William B., to Harnischfeger Corporation. Electro-hydraulic steering system for vehicle having steerable front and rear ground wheels. 3,856,102, Cl. 180-79.20c.

Quick, Donald J., to International Harvester Company. Jib cranes. 3,855,954, Cl. 212-8.00r.

Quinto, Mario. Reversible motor hydraulic control system. 3,855,791, Cl. 60-380.000.

Quiring, Bernd: *See—*
Wagner, Kuno; Oertel, Gunter; Golitz, Hans Dietrich; and Quiring, Bernd, 3,856,756.

Quoss, Robert N.: *See—*
Siegelman, Abe; Quoss, Robert N.; and Pawlak, Raymond M., 3,856,536.

Rabett, Reginald George Edward, to Adams, Robert D. and Sharland, Ian J. Tools for use in percussive machines. 3,856,107, Cl. 181-33.00a.

Radlmann, Eduard: *See—*
Bodesheim, Ferdinand; Radlmann, Eduard; Schaffner, Heinz; and Nischk, Gunther, 3,856,738.

Radlove, Sol B.; Ravve, Abraham; and Brown, Kenneth H., to Continental Can Company. Ultraviolet polymerizable printing ink comprising vehicle prepared from beta-hydroxy esters and polyitaconates. 3,856,744, Cl. 260-40.00r.

Radoff, Steven: *See—*
Varadibriarwood, Andrew G.; Rubinstein, Richard B.; and Radoff, Steven, 3,857,046.

Raetzsch, Carl W.; and Cunningham, Hugh, to PPG Industries, Inc. Apparatus for producing uniform anolyte heads in the individual cells of a bipolar electrolyzer. 3,856,651, Cl. 204-255.000.

Raffelson, Harold; and Suda, Michael, to Monsanto Company. Modified P-V-Fe catalyst for production of maleic anhydride from saturated aliphatic hydrocarbons. 3,856,824, Cl. 260-346.80a.

Rakoczi, Jozsef; Beck, Ivan; Komlos, Endre; deceased (by Komlos, Anna, nee Kiss; heir); Petocz, Lujza; and Grasser, Katalin. Pharmaceutically active new guanidino-alkylcyclo-imines. 3,856,778, Cl. 260-239.00b.

Rall, Waldo: *See—*
Adams, Richard C.; Kachik, Robert H.; Pignocco, Arthur J.; and Rall, Waldo, 3,856,076.

Ramirez, Ceneida. Two piece hospital gown. 3,855,635, Cl. 2-114.000.

Ramos, Jose R.: *See—*
Farrell, Richard S.; and Ramos, Jose R., 3,855,917.

Ramsden, Hugh E., to Rhodia, Inc. Process for the preparation of Grignard reagents and their utilization in organic syntheses. 3,856,867, Cl. 260-665.00g.

Ramshaw, Anthony John: *See—*
Leonard, Gordon Harris; and Ramshaw, Anthony John, 3,857,062.

Rankin, Billy F., to Burton Parsons Chemicals, Inc. Opthalmic solution. 3,856,919, Cl. 424-78.000.

Rasmussen, John P.: *See—*
Steigerwald, John R.; Rasmussen, John P.; and Crapanzano, Angelo T., 3,856,365.

Rautio, Wilbur S.: *See—*
Fisher, Edward; Rautio, Wilbur S.; Jankowiak, Roman; and Natell, Richard W., 3,856,983.

Ravitts, Richard B., to Richards of Rockford, Inc. Floating mixer. 3,856,272, Cl. 259-95.000.

Ravve, Abraham: *See—*
Radlove, Sol B.; Ravve, Abraham; and Brown, Kenneth H., 3,856,744.

Ray Pak, Inc., mesne: *See—*
Grimme, Henry L., Jr.; and Osborn, Ray, 3,856,676.

Raytheon Corporation: *See—*
MacMaster, George H.; and Dudley, Kenneth W., 3,857,009.

RB Toy Development Co.: *See—*
Kupperman, Sam; and Kupperman, Dennis I., 3,856,241.

RCA Corporation: *See—*
Arnold, Anthony Francis, 3,856,565.
Avery, Leslie Ronald, 3,857,105.
Huang, Ho-Chung, 3,857,113.
Knight, Mark Berwyn, 3,857,047.
Napoli, Louis Sebastian; and Hughes, John Joseph, 3,856,591.
Nestleroth, Paul Lavern, 3,857,058.
Weimer, Paul Kessler, 3,856,989.

Reading, George R.: *See—*
Moorehead, Harvey Robert; and Reading, George R., 3,856,010.

Rebane, George J.; and Grossman, Norman R., to Integrated Sciences Corporation. Graphic input device. 3,857,022, Cl. 235-151.000.

Reed, Geoffrey Ronald, to British Iron and Steel Research Association, The. Coil package and method of forming a package. 3,856,141, Cl. 206-407.000.

Rees, Charles E., Jr., to Johns-Manville Corporation. Spray deflector and arrangement for rotatable sprinklers. 3,856,207, Cl. 239-230.000.

Regie Nationale des Usines Renault: *See—*
Giordano, Jean-Louis, 3,856,260.

Regie Nationale des Usines Renault, et Automobiles Peugeot: *See—*
Fortin, Raymond, 3,855,662.

Regis, Rene Marc Jean, to Les Aplications Industrielles du Tube. Telescopic support for seats, tables and the like. 3,856,252, Cl. 248-402.000.

Reichhold Chemicals, Inc.: *See—*
Kirkpatrick, Harold B., 3,856,902.
White, James T.; and Gumprecht, Donald L., 3,856,562.

Reierson, Robert L.: *See—*
Theard, Leslie Peter; Peterson, Frank Clyde; Russell, John Lynn, Jr.; and Reierson, Robert L., 3,856,717.

Reiland, Bernard F., to Textron, Inc. Screw anchored wallboard assembly. 3,855,750, Cl. 52-363.000.

Remalo Engineering Company Limited: *See—*
Triggs, Henry Francis, 3,856,311.

Remington Arms Company, Inc.: *See—*
English, Myrle H.; Goodstal, Laurence; Leek, Wayne E.; Sanzo, Robert J.; Turner, Robert L.; Workman, Clark B.; and Yetter, Edward W., 3,857,025.

Renfroe, R. Bogan: *See—*
Harmon, Gardy R.; Norman, John D.; and Tadlock, Guy M., 3,856,218.

Rentzea, Costin: *See—*
Zech, Bernd; Jung, Johann; and Rentzea, Costin, 3,856,501.

Resler, Edwin L., Jr.: *See—*
Harris, Fred T.; and Resler, Edwin L., Jr., 3,857,050.

Revillet, Georges: *See—*
Sanz, Manuel C.; and Revillet, Georges, 3,856,415.

Rexham Corporation: *See—*
Johnson, Kenneth R.; and Lense, Robert F., 3,855,907.

Reynard, Kennard A.: *See—*
Rose, Selwyn H.; and Reynard, Kennard A., 3,856,713.

Reynard, Kennard A.; and Rose, Selwyn H., to Horizons Incorporated; a division of Horizons Research Incorporated. Poly(alkoxyaryloxyphosphazene) elastomers. 3,856,712, Cl. 260-2.00p.

Reynolds, David W.: *See—*
Pollman, Frederic W.; Reynolds, David W.; Ross, William A.; and Schauer, George A., 3,855,793.

Reynolds Metals Company: *See—*
Carithers, Val G., 3,856,708.

Reynolds, R. J., Tobacco Company: *See—*
Smith, Jay G., Jr.; and Joyce, Jerry R., 3,855,760.

Reynolds, Richard L., to Illinois Tool Works Inc. Washer device. 3,856,066, Cl. 151-38.000.

Rhee, Jhoon Goo. Karate glove. 3,855,633, Cl. 2-18.000.

Rheinhold & Mahla GmbH: *See—*
Sauerbrunn, Irmhild; and Bellemann, Rudolf, 3,855,811.

Rhoades, Rex V. Fluid flow actuated device. 3,855,860, Cl. 73-243.000.

Rhodia, Inc.: *See—*
Ramsden, Hugh E., 3,856,867.

Riccio, Pasquale R., to Ciba-Geigy Corporation. Single dose, replaceable supply air pressure operated dispenser. 3,856,185, Cl. 222-193.000.

Richards of Rockford, Inc.: *See—*
Ravitts, Richard B., 3,856,272.

Richardson Company, The: *See—*
Dunlop, William R., 3,856,175.

Richardson, Oliver F.: *See—*
Clark, Glenn W.; and Richardson, Oliver F., 3,857,015.

Richardson-Merrell Inc.: *See—*
Fleming, Robert W.; and Sill, Arthur D., 3,856,789.

Ridgeway, John J., to Explo-Ridgeway International Limited. Linear shaped charge device. 3,855,929, Cl. 102-24.0hc.

Rieger, Hans Wolfhart: *See—*
Kugler, Tibor; and Rieger, Hans Wolfhart, 3,856,650.

Rieter Machine Works Ltd.: *See—*
Wust, Olivier, 3,856,222.

Riggle, Peter: *See—*
Noble, Jack E.; Riggle, Peter; Emigh, Stuart G.; and Martini, William R., 3,855,795.

Riggs, Dean D.: *See—*
Cecil, Shelby; and Riggs, Dean D., 3,857,080.

Riker Laboratories, Inc.: *See—*
Moore, George G. I.; and Lappi, Larry R., 3,856,859.

Riley Stoker Corporation: *See—*
Kaltenbach, Robert Paul; and Rogers, Wayne C., 3,856,214.

Riley-Beaird Inc.: *See—*
Gilbert, Frederick W., 3,856,630.

Rinaldi, Ronald M. Butchers twine dispenser. 3,856,232, Cl. 242-146.000.

Rinto, Georges, to Creusot-Loire. Bogic linear inductor suspension assembly. 3,855,940, Cl. 105-77.000.

Risser, J. Marlin. Overhead door movement control and support unit. 3,856,073, Cl. 160-201.000.

Rist, Michel, to Societe Anonyme Francaise du Ferodo. Device for driving two parts in rotation. 3,855,790, Cl. 60-361.000.

Ristow, Dietrich: *See—*
Heywang, Hermann; Kobale, Manfred; Preissinger, Karl-Heinz; Ristow, Dietrich; and Wehnelt, Ulrich, 3,857,074.

Ritscher, Thomas: *See—*
Engvall, Erik Arne; and Ritscher, Thomas, 3,856,113.

Rivinius, Theodore. Drawbar support for leveling circle frame on road graders. 3,856,089, Cl. 172-4.500.

Ro, Rolland Shih-Yuan: *See—*
Collette, John Wilfred; Ro, Rolland Shih-Yuan; and Sonnenberg, Fred Max, 3,856,765.

Roach, William J., to Oxford Laboratories, Inc. Liquid transfer pipetting device. 3,855,867, Cl. 73-425.600.

Robbart, Edward. Treatment of cellulose. 3,856,558, Cl. 117-106.00r.

Roberge, James K.: *See—*
Wilensky, Samuel; and Roberge, James K., 3,857,021.

Roberts, Peter Clive Buckley, to Bovril Limited. Vertical gel electrophoresis apparatus. 3,856,655, Cl. 204-299.000.

Roberts, Thomas C., to Curtiss-Wright Corporation. Rotary combustion engine with improved firing system. 3,855,972, Cl. 123-8.090.

Robertshaw Controls Company: *See—*
Caldwell, Edward N., 3,855,960.
Caldwell, Edward N., 3,856,044.
Mitts, Richard K.; and Tyler, Hugh Jean, 3,856,057.

Robertson Bauelemente G.m.b.H.: *See—*
Brinton, Bernard E.; and Schorn, Ludwig, 3,855,910.

Robinson, Samuel Clifford: *See—*
Pearl, David R.; and Robinson, Samuel Clifford, 3,855,887.

Rocklin, Albert L., to Shell Oil Company. Fluorine-containing organic carbonate. 3,856,589, Cl. 149-109.400.

Rockwell International Corporation: *See—*
Beller, Laurence S., 3,857,052.

Roell, William J., to Beloit Corporation. Multi-ply paper forming machine with upward and downward forming runs. 3,856,618, Cl. 162-299.000.

Roeske, Eugene A. Analog position controller having two stage valve control. 3,856,040, Cl. 137-488.000.

Rogers, Howard G.: *See—*
Bilofsky, Ruth C.; and Rogers, Howard G., 3,856,521.

Rogers, Orris A.; Camp, Eldridge K.; and Borgmann, John P., to American Chemical & Refining Company, Incorporated. Platinum clad tantalum anode assembly. 3,856,653, Cl. 204-286.000.

Rogers, Wayne C.: *See—*
Kaltenbach, Robert Paul; and Rogers, Wayne C., 3,856,214.

Rohling, Hermann. Plant watering device. 3,856,205, Cl. 239-63.000.
Rohm and Haas Company: *See—*
O'Brien, Joseph L.; and Derby, Richard, 3,856,840.
Rohn, Ivan D.; Kleine, Richard A.; and Wright, Charles A., to Rohn Manufacturing Co. High-level light tower with light lowering device and control system therefor. 3,856,639, Cl. 240-64.000.
Rohn Manufacturing Co.: *See—*
Rohn, Ivan D.; Kleine, Richard A.; and Wright, Charles A., 3,856,639.
Rolair Systems, Inc.: *See—*
Burdick, Robert E., 3,855,755.
Roland Offsetmaschinenfabrik Faber & Schleicher AG: *See—*
Simeth, Claus, 3,855,927.
Rolls-Royce (1971) Limited: *See—*
Douglas, Joseph, 3,855,864.
Rollyson Aluminum Products: *See—*
Sheaf, James E., 3,855,732.
Roman, Robert J.: *See—*
Bundschuh, John J.; Roman, Robert J.; and Burndshuh, John J., 3,856,234.
Rooney, Thomas M. Flange protector. 3,856,050, Cl. 138-96.00r.
Rose, Selwyn H.: *See—*
Reynard, Kennard A.; and Rose, Selwyn H., 3,856,712.
Rose, Selwyn H.; and Reynard, Kennard A., to Horizons Incorporated a division of Horizons Research Incorporated. Elastomeric poly(aryloxyphosphazene) copolymers. 3,856,713, Cl. 260-2.00p.
Rosen, Harvey Milton: *See—*
Lee, Haju; and Rosen, Harvey Milton, 3,856,671.
Rosenbauer, Hans-Gunter: *See—*
Aignesberger, Alois; and Rosenbauer, Hans-Gunter, 3,856,542.
Rosenberger, Michael; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Aryl ketals of polycyclic oxo compounds and processes. 3,856,817, Cl. 260-340.500.
Rosenkranz, Hans Jurgen: *See—*
Traenckner, Hans-Joachim; Rudolph, Hans; Rosenkranz, Hans Jurgen; Fuhr, Karl; and Patheiger, Manfred, 3,856,644.
Rosinski, Alexander B., Jr.: *See—*
Drews, Reinhold Alvin; Rosinski, Alexander B., Jr.; and Gauer, Joseph August, 3,856,036.
Ross, William A.: *See—*
Pollman, Frederic W.; Reynolds, David W.; Ross, William A.; and Schauer, George A., 3,855,793.
Rossi, Anthony T., to Tropicana Products, Inc. Cap for container. 3,856,171, Cl. 215-256.000.
Rossi, Pietro Paolo: *See—*
Siclari, Francesco; and Rossi, Pietro Paolo, 3,856,833.
Rotel AG: *See—*
Feierabend, Georg, 3,855,911.
Roth, Anton. Elevator garage. 3,856,160, Cl. 214-16.1dc.
Roth, John F.: *See—*
Lose, John G.; and Roth, John F., 3,855,839.
Rothmann, Hans; and Keil, Werner, to Gesellschaft fur Elektrometallurgie mbH. Method of obtaining vanadic or tungstic or molybdic hydroxide. 3,856,641, Cl. 204-96.000.
Roussel Uclaf: *See—*
Allais, Andre; Meier, Jean; and Cerede, Jean, 3,856,909.
Roussel-UCLAF: *See—*
Allais, Andre; Lilas, Les; and Nomine, Gerard, 3,856,967.
Nedelec, Lucien; Guillaume, Jacques; and Allais, Andre, 3,856,910.
Perronnet, Jacques; and Girault, Pierre, 3,856,974.
Royal Industries: *See—*
Adler, Jason A.; and Bartlett, David R., 3,857,089.
Royer Foundry and Machine Co.: *See—*
Swatko, Albert, 3,856,212.
Royle, John & Sons: *See—*
Skobel, Max, 3,856,595.
Rubinstein, Richard B.: *See—*
Varadibriarwood, Andrew G.; Rubinstein, Richard B.; and Radoff, Steven, 3,857,046.
Rudolph, Hans: *See—*
Traenckner, Hans-Joachim; Rudolph, Hans; Rosenkranz, Hans Jurgen; Fuhr, Karl; and Patheiger, Manfred, 3,856,644.
Rumpf, Hans: *See—*
Rumpf, Hans; Leschonski, Kurt P.; and Schubert, Helmar (said Leschonski and said Schubert assors. to said), 3,856,483.
Rumpf, Hans; Leschonski, Kurt P.; and Schubert, Helmar, said Leschonski and said Schubert assors. to said Rumpf, Hans. Method and device for degassing liquids. 3,856,483, Cl. 55-38.000.
Rumpf, Robert J.: *See—*
Arning, Klaus H.; and Rumpf, Robert J., 3,856,323.
Rusch, Kenneth C.: *See—*
Beck, Robert H.; and Rusch, Kenneth C., 3,856,424.
Russell, Donald H.: *See—*
Dieter, Jerry A.; Russell, Donald H.; and Sauer, Richard W., 3,856,720.
Russell, John Lynn, Jr.: *See—*
Theard, Leslie Peter; Peterson, Frank Clyde; Russell, John Lynn, Jr.; and Reierson, Robert L., 3,856,717.
Ruter, Lewis L. Holder. 3,856,243, Cl. 248-42.000.
Sabatini, Bruno: *See—*
Bertolotti, Nino; Sabatini, Bruno; and Mocci, Giuseppe, 3,856,281.
Sackner Products, Inc.: *See—*
Markley, Jerry M., 3,856,611.
Sacks, Jack. Noise filter. 3,857,104, Cl. 328-167.000.
S.A.E.S. Getters S.p.A.: *See—*
Porta, Paolo Della; Cataluppi, Angelo; Ferrario, Bruno; and Montalenti, Paolo, 3,856,709.
Safford, Richard W.: *See—*
Torian, John T.; and Safford, Richard W., 3,856,237.
Safranski, Richard W.: *See—*
Bartlo, John S.; Safranski, Richard W.; Hart, Charles G.; and Wieseckel, David A., 3,856,097.
Sagami Chemical Research Center: *See—*
Nagai, Yoichiro; and Ojima, Iwao, 3,856,842.
Nagai, Yoichiro; and Ojima, Iwao, 3,856,843.
Sagawa, Norio: *See—*
Nishio, Minoru; and Sagawa, Norio, 3,857,003.
Sahatjian, Ronald A.: *See—*
George, Louis J.; and Sahatjian, Ronald A., 3,856,522.
Sahores, Jean, to Societe Nationale des Petroles d'Aquitaine. Glow-tube for X-ray spectrometry with directly excited samples. 3,857,038, Cl. 250-374.000.
Saiia, Anthony J.: *See—*
Haffner, Donald G.; and Saiia, Anthony J., 3,856,090.
Saint-Gobain Industries: *See—*
Flamand, Guy; and Lazzarini, Henri, 3,856,131.
Saito, Jiro: *See—*
Susuki, Rinnosuke; Hoshi, Hiroshi; Saito, Jiro; Murakami, Keiichi; and Yamada, Hisashi, 3,856,746.
Saito, Nagao; Kobayashi, Kazuhiko; and Tomimoto, Naokazu, to Mitsubishi Denki Kabushiki Kaisha. Method and apparatus for controlling electrical discharge shaping. 3,857,011, Cl. 219-69.00p.
Saito, Shiro, to Nikka Kabushiki Kaisha. Apparatus for depositing a powdered substance on the interior surface of an inflatable tube. 3,855,968, Cl. 118-308.000.
Saito, Yuzi: *See—*
Maeda, Kazuo; Takizawa, Muneto; and Saito, Yuzi, 3,856,130.
Moriguchi, Shigeru; Takeuchi, Tetsuo; and Saito, Yuzi, 3,855,687.
Saitoh, Shigeru, to Nissan Motor Company, Limited. Connecting means between an impact absorbing side frame member of a motor vehicle frame structure and a transverse member. 3,856,324, Cl. 280-106.00r.
Sakai, Kouichi; Tokai, Yoshiaki; and Matsunaka, Sadayoshi, to Teijin Limited. Resin composition having a marble-like appearance. 3,856,884, Cl. 260-860.000.
Sakakibara, Shunpei; Kumahara, Yuichi; and Kimura, Terutoshi. Method for preparing biologically active (pyro) glutamyl-histidyl-tryptophyl-seryl. tyrosyl glycyl-leucyl-arginyl-prolyl-glycine amide. 3,856,769, Cl. 260-112.500.
Sakamoto, Kiyoaki: *See—*
Iwata, Tokushige; Sakamoto, Kiyoaki; Nawata, Teruo; Endo, Hiroyasu; Nakano, Masaru; and Murayama, Hajime, 3,856,478.
Sakurai, Masayuki; Takahashi, Syozo; and Kikuno, Hideo, to Tokyo Shibaura Electric Co., Ltd. Aoparatus for conveying sheet materials. 3,856,132, Cl. 198-30.000.
Salem Tool Company, The: *See—*
Case, Carl J., 3,856,093.
Salleroli, Robert. Furniture with log-cabin effects. 3,855,948, Cl. 108-161.000.
Sally, Theodore J.: *See—*
Morris, Earl L.; and Sally, Theodore J., 3,855,649.
Saltel, Jean Louis. Short-cycle molding device. 3,856,444, Cl. 425-60.000.
Salter, Steven J.: *See—*
Mulich, Stephen F.; Duffy, Donald R.; and Salter, Steven J., 3,855,930.
Saltman, William M.: *See—*
Throckmorton, Morford C.; and Saltman, William M., 3,856,764.
Saltzman, William H., to Intellectual Property Development Corporation. Method of treating fatty liver. 3,856,953, Cl. 424-238.000.
Salvi, Attilio A., to General Properties Anstalt. Apparatus for producing candyfloss. 3,856,443, Cl. 425-9.000.
Sanders, Robert N.; and Valdo, Alex R., to Ethyl Corporation. Method of increasing hardness of aluminum-silicon composite. 3,856,583, Cl. 148-159.000.
Sanderson, Karl, 1/2 to Wilson, Lee, Engineering Company of Canada Ltd. Furnace cover. 3,855,952, Cl. 110-173.00a.
Sanderson, William R.: *See—*
Hickey, Roy E.; and Sanderson, William R., 3,856,391.
Sandoz, Inc.: *See—*
Griot, Rudolf G., 3,856,863.
Sandoz-Wander, Inc.: *See—*
Cooke, George A.; and Houlihan, William J., 3,856,960.
Kathawala, Faizulla G., 3,856,808.
Simpson, William R., 3,856,796.
Sandvik Aktiebolag (formerly k/a Sandvikens Jernverks Aktiebolag): *See—*
Wirfelt, Sven Axel Olof, 3,855,680.
Sanford, George N.; and Sanford, William H. Swimming pool covering apparatus. 3,855,643, Cl. 4-172.120.
Sanford, William H.: *See—*
Sanford, George N.; and Sanford, William H., 3,855,643.
Sanko Kiki Kabushiki Kaisha: *See—*
Yasue, Setsuo; and Yamamoto, Tomio, 3,856,167.
Sano, Mitsuyoshi: *See—*
Kato, Tadanari; Ikemi, Tadashi; Ooishi, Tutomu; Sano, Mitsuyoshi; Hayashida, Kengo; and Matsumoto, Chinami, 3,856,707.

Sansbury, Jerry F.: *See—*
Fox, James D.; Norman, Earl P., Jr.; and Sansbury, Jerry F., 3,856,179.

Sanz, Manuel C.; and Revillet, Georges, to Micromedic Systems, Inc. Light shifting system for use in an optical instrument, such as a spectrophotometer. 3,856,415, Cl. 356-205.000.

Sanzo, Robert J.: *See—*
English, Myrle H.; Goodstal, Laurence; Leek, Wayne E.; Sanzo, Robert J.; Turner, Robert L.; Workman, Clark B.; and Yetter, Edward W., 3,857,025.

Sapkus, Jurgis; Lewis, J. Stephen; Vowles, Colin; and Yarbrough, William R., to Mattel Inc. Animation device for a figure toy. 3,855,729, Cl. 46-116.000.

Saravis, Calvin A.: *See—*
Forget, Ronald D.; and Saravis, Calvin A., 3,855,846.

Sarges, Reinhard: *See—*
Kuhla, Donald E.; Sarges, Reinhard; and Wiedermann, Hans E., 3,856,806.

Sasaki, Isao: *See—*
Ide, Fumio; Asao, Mamoru; Hasegawa, Akira; and Sasaki, Isao, 3,856,894.

Sato, Ken; and Nakamoto, Kikuo, to Nippon Carbon Company Limited. Lubricant containing the inorganic polymeric graphite fluoride in an improved dispersed state thereof and method for the manufacture of the same. 3,856,686, Cl. 252-30.000.

Sato, Masamichi: *See—*
Honjo, Satoru; and Sato, Masamichi, 3,856,519.

Sato, Wasuke; Yamamoto, Seijiro; Kuwabara, Nobuaki; and Adachi, Shigeru, to Showa Denko K.K. Tobacco filters. 3,856,025, Cl. 131-264.000.

Sato, Yoshio, to Kabushiki Kaisha Ideal. Automatically openable and closable umbrella. 3,856,030, Cl. 135-22.000.

Satoh, Daisuke, to Shionogi & Co., Ltd. Pharmaceutical compositions. 3,856,944, Cl. 424-182.000.

Satomura, Masato, to Fuji Photo Film Co. Ltd. Light-sensitive high polymer compound and process for the preparation thereof. 3,856,757, Cl. 260-77.5cr.

Satto, Jiro: *See—*
Susuki, Rinnosuke; Hoshi, Hiroshi; Satto, Jiro; Takano, Koichi; and Kosikawa, Kiyoshi, 3,856,614.

Saucy, Gabriel: *See—*
Rosenberger, Michael; and Saucy, Gabriel, 3,856,817.

Saucy, Gabriel, to Hoffmann-La Roche, Inc. Steroidal intermediates. 3,856,861, Cl. 260-566.00a.

Sauer, Philip H., to Cenco Medical/Health Supply Corporation. Sterile specimen trap. 3,855,997, Cl. 128-2.00f.

Sauer, Richard W.: *See—*
Dieter, Jerry A.; Russell, Donald H.; and Sauer, Richard W., 3,856,720.

Sauerbrunn, Irmhild; and Bellemann, Rudolf, to Rheinhold & Mahla GmbH. Insulation for liquid gas containers, especially spherical containers. 3,855,811, Cl. 62-45.000.

Saunders, Hollis, S., to General Cable Corporation. Method of making insulated magnet wire. 3,856,566, Cl. 117-218.000.

Savage, Conwell, to Westinghouse Electric Corporation. Elevator system. 3,856,116, Cl. 187-28.000.

Savage, Donald D.; and Mills, Maurice T. Tree harvesting system. 3,856,060, Cl. 144-34.00b.

Sawazaki, Masatoshi, to Precision Fukuhara Works, Ltd. Electromechanical needle selecting means for circular knitting machines. 3,855,819, Cl. 66-50.00r.

Sawers, James R., Jr.: *See—*
Johnson, Donald R.; and Sawers, James R., Jr., 3,856,480.

Sawyer, Bruce A. Positioning device. 3,857,075, Cl. 318-38.000.

Sawyer, Bruce A. Actuating system. 3,857,078, Cl. 318-608.000.

Sbarra, Anthony J., 1/2 interest to Crowley, Richard P. Method and apparatus for the identification of microorganisms. 3,856,628, Cl. 195-103.50r.

Scavuzzo, Robert John: *See—*
Payne, Richard Steven; and Scavuzzo, Robert John, 3,856,578.

Schadlich, Gunther; Haenisch, Renate; and Moraw, Roland, to Kalle Aktiengesellschaft. Method and materials for making half tone prints. 3,856,529, Cl. 96-81.000.

Schadow, Rudolf. Indicating push button mechanism. 3,855,961, Cl. 116-124.00r.

Schadow, Rudolf, Firma KG: *See—*
Hinze, Klaus, 3,855,959.

Schaefer, William E.; and Bender, Richard E., to General Dynamics Corporation. Game rackets method of manufacturing. 3,856,603, Cl. 156-245.000.

Schaeffer, Paul R., to Frank, Alan I. W., The, Corporation. Method of molding expandable polystyrene. 3,856,903, Cl. 264-51.000.

Schafer, Josef, to Telesco Brophey Limited. Umbrella runner. 3,856,032, Cl. 135-28.000.

Schafer, Paul: *See—*
Huber-Emden, Helmut; and Schafer, Paul, 3,856,849.

Schaffner, Heinz: *See—*
Bodesheim, Ferdinand; Radlmann, Eduard; Schaffner, Heinz; and Nischk, Gunther, 3,856,738.

Schatton, Paul: *See—*
Elm, Karl Horst; Schatton, Paul; and Kruse, Joachim, 3,856,337.

Schauer, George A.: *See—*
Pollman, Frederic W.; Reynolds, David W.; Ross, William A.; and Schauer, George A., 3,855,793.

Scheer, Eugene R.: *See—*
Lagrange, Don E.; Davis, Edward J.; Scheer, Eugene R.; Brewer, Ralph E.; and Hamilton, Curtis A., 3,857,042.

Scheinpflug, Hans: *See—*
Daum, Werner; Scheinpflug, Hans; and Frohberger, Paul-Ernst, 3,856,811.

Schelkmann, Wilhelm. Method of retreading vehicle tires. 3,856,601, Cl. 156-96.000.

Schenck, Leslie M.: *See—*
Eiseman, Fred S., Jr.; Schenck, Leslie M.; and Beiswanger, John P. G., 3,856,895.

Schering Aktiengesellschaft: *See—*
Fuchs, Peter; and Schopflin, Gisela, 3,856,931.

Schering Corporation: *See—*
Steinman, Martin, 3,856,787.

Schiesser AG: *See—*
Schiesser, Walter Hugo, 3,856,447.

Schiesser, Walter Hugo, to Schiesser AG. Extrusion head for the manufacture of hoses formed of plastic masses and containing reinforcement inserts. 3,856,447, Cl. 425-114.000.

Schiffman, Jerome D. Method of making a comb. 3,855,689, Cl. 29-433.000.

Schladetsch, Hans Jakob: *See—*
Hoyer, Ernst; and Schladetsch, Hans Jakob, 3,856,773.

Schlage Lock Company: *See—*
Tornoe, John A.; and Dyer, Curtis A., 3,856,339.

Schlumberger Technology Corporation: *See—*
Claycomb, Jackson R., 3,855,853.
Claycomb, Jackson R., 3,855,857.

Schmatz, Duane J., to Ford Motor Company. Aluminum soldering. 3,855,679, Cl. 29-197.000.

Schmerling, Louis, to Universal Oil Products Company. Flame retardant compositions. 3,856,888, Cl. 260-881.000.

Schmid, Anthony P., to Owens-Illinois, Inc. Semiconducting coating for electrical glass conduits. 3,856,979, Cl. 174-15.00c.

Schmidt, Ewald; and Wiessner, Willi, to Leitz, Ernst, G.m.b.H. Light meter with nuclear light source. 3,856,416, Cl. 356-219.000.

Schmidt, Werner, to Maschinenfabrik Rissen GmbH. Device for the manufacture of paper cups. 3,855,908, Cl. 93-36.50r.

Schmidt, William M.: *See—*
Seifert, Lester H.; Powers, Raymond P.; Schmidt, William M.; Thorwaldsen, Stanley E.; Smith, Frederick W.; McElroy, David C.; and Dunton, Roy P., 3,855,763.

Schnackenberg, Werner D., to Gates Rubber Company, The. Power transmission belt, reinforcement and process. 3,855,870, Cl. 74-234.000.

Schneider, Eckart: *See—*
Heitmann, Knut; and Schneider, Eckart, 3,856,401.

Schneider, Morton: *See—*
Foster, Burnham; and Schneider, Morton, 3,855,949.

Schneider, Richard S.; and Ullman, Edwin F., to Syva Corporation. Interferant removal from amphetamine immunoassay. 3,856,469, Cl. 23-230.00b.

Schnell, Hermann: *See—*
Margotte, Dieter; Vernaleken, Hugo; and Schnell, Hermann, 3,856,886.

Schnell, Josef. Frictional type exercising device. 3,856,297, Cl. 272-79.00b.

Schnettler, Richard A.; and Suh, John T. Process of preparing alpha-hydroxymethyl aminoacids. 3,856,854, Cl. 260-519.000.

Schnurrbusch, Karl; and Preiss, Peter, to Bayer Aktiengesellschaft. Surface polishes based on organopolysiloxanes and wax. 3,856,533, Cl. 106-10.000.

Scholz, Hansjurgen; Brambilla, Luigi; and Allgaier, Rudolf, to Daimler-Benz Aktiengesellschaft. Impact-absorbing instrument panel for vehicles. 3,856,103, Cl. 180-90.000.

Schoonmaker, Charles Donald; Hebel, Carl G.; and Bardsley Robert Francis, to General Foods Corporation. Sandwich making apparatus. 3,855,912, Cl. 99-450.400.

Schopflin, Gisela: *See—*
Fuchs, Peter; and Schopflin, Gisela, 3,856,931.

Schorn, Hedwig: *See—*
Brinton, Bernard E.; and Schorn, Ludwig, 3,855,910.

Schorn, Ludwig: *See—*
Brinton, Bernard E.; and Schorn, Ludwig, 3,855,910.

Schott, Charles W. Methods for making beads. 3,856,899, Cl. 264-8.000.

Schrader, Gerhard; and Homeyer, Bernhard. N-isopropyl-O-ethyl-O-arylphosphoric acid ester amides as arthropodicides and nematocides. 3,856,949, Cl. 424-216.000.

Schroeder, Charles F., to Owens-Corning Fiberglas Corporation. Method of making woven sheet for rubber reinforcement. 3,855,678, Cl. 28-74.00r.

Schubert, Helmar: *See—*
Rumpf, Hans; Leschonski, Kurt P.; and Schubert, Helmar, 3,856,483.

Schultz, John J., to Electric Hose & Rubber Company. Lead extrusion device with means for removing a die member without inactivating the material feed means. 3,856,446, Cl. 425-113.000.

Schwartz, Osten, to Aktiebolaget Electrolux. Remote control for vacuum cleaner motor. 3,855,665, Cl. 15-339.000.

Schwarzkopf, Anton, to Schwarzkopf, Anton, Firma. Motorized roller-coaster car. 3,855,936, Cl. 104-63.000.

Schwarzkopf, Anton, Firma: *See—*
Schwarzkopf, Anton, 3,855,936.

Schweitzer, Samuel; and Ziffermayer, Georg, to Boveri, Brown, & Company Limited. Apparatus for the gettering of semiconductors. 3,856,472, Cl. 23-252.000.
Schweizerisches Serum- und Impfinstitut und Institut zur Erforschung der Infektionskrankheiten: *See*—
Germanier, Rene, 3,856,935.
Schyler Development Corporation: *See*—
Vick, James A.; and Castner, Charles S., 3,856,936.
SCM Corporation: *See*—
Hedman, Clarence L., Jr.; Myrenne, Karl-Dieter S.; and Vartanian, Perry H., Jr., 3,856,381.
Scofield, Bruce A., to International Harvester Company. Synchronizing means for sequential fuel injection. 3,855,973, Cl. 123-32.0ea.
Scott Environmental Technology, Inc.: *See*—
Strain, Donny R.; and Martin, Daniel B., 3,856,033.
Scott, James E., Jr.; and Woodward, Ernest Ray, to Pacific Resins & Chemicals, Inc. Phenolic resin-containing cellulosic overlays for woody substrates. 3,856,616, Cl. 162-165.000.
Scott, James L.: *See*—
Pollock, Charles B.; Scott, James L.; and Leitnaker, James M., 3,856,622.
Scott, John Gabriel Valentine: *See*—
Thurston, Elvin Frederick William; and Scott, John Gabriel Valentine, 3,856,532.
Scott, O. M., & Sons Company, The: *See*—
Williams, Marvin E., 3,856,211.
Scott Paper Company: *See* —
Mandeville, Arthur R., 3,856,555.
Scoville, Chauncey J.: *See*—
Scoville, Wright A.; and Scoville, Chauncey J., 3,855,754.
Scoville, Wright A.; and Scoville, Chauncey J. Miter joint lock and combination. 3,855,754, Cl. 52-755.000.
Scull, William L., to Leslie Co. Multiple stage restrictor. 3,856,049, Cl. 138-42.000.
Sea Savory, Inc.: *See*—
Wenstrom, Richard T., 3,855,668.
Sea Tank Co.: *See*—
Lacroix, Roger, 3,855,803.
Seaberg, David H., to Case, J. I., Company. Method of using a hydraulic leveling circuit on an implement. 3,856,163, Cl. 214-152.000.
Seager, Robert Vincent: *See*—
Allman, Denis John; and Seager, Robert Vincent, 3,856,437.
Searing, Harvey R.: *See*—
Wiley, Ron; and Searing, Harvey R., 3,855,889.
Searle, G. D., & Co.: *See*—
Hsu, Charles F.; Jiu, James; and Mizuba, Seth Setsuo, 3,856,852.
Sears, Karl David, to International Telephone and Telegraph Corporation. Etherification of bark extracts and condensed tannins. 3,856,845, Cl. 260-465.900.
SEB S.A.: *See*—
Trouilhet, Maurice Marie Achille, 3,855,717.
Sebilleau, Roger V.; and Eklund, Kurt I. Wood and metal pallet. 3,855,945, Cl. 108-57.000.
Seebinger, Frederick L., to American Trading and Production Corporation. Adjustable stand. 3,856,253, Cl. 248-411.000.
Seichter, Daniel J.; and Ehrhardt, Orville W., to Giddings & Lewis, Inc. Rotary position transducer assembly using hydrostatic bearings. 3,857,051, Cl. 310-36.000.
Seidel, Eckhard: *See*—
Menzel, Gerhard; Seidel, Eckhard; and Jaenichen, Gunther, 3,856,726.
Seidel, Harold, to Bell Telephone Laboratories, Incorporated. Amplifier with *n*-port signal excitation. 3,857,106, Cl. 330-53.000.
Seifert, Lester H.; Powers, Raymond P.; Schmidt, William M.; Thorwaldsen, Stanley E.; Smith, Frederick W.; McElroy, David C.; and Dunton, Roy P. Self-propelled rotary lawn mower. 3,855,763, Cl. 56-320.200.
Seiko Koki Kabushiki Kaisha: *See*—
Ogihara, Masuo; and Watanabe, Masanori, 3,856,393.
Seinfeld, Marc Michael; and Shedyak, George Alexander. Oxidized petroleum pitch. 3,856,657, Cl. 208-6.000.
Seki, Toshio; Suzuki, Kazaburo; and Matsuzaki, Takashi, to Nitto Kasei Co., Ltd. Light stabilized synthetic resin compositions containing certain benzotriazoylphenoxy tin compounds. 3,856,727, Cl. 260-23.0xa.
Semon, Howard W., to General Electric Company. Closure for fire resistant structure. 3,855,741, Cl. 52-19.000.
Semperit Osterreichisch-Amerikanische: *See*—
Gorter, Werner, 3,856,067.
Seng, Florin; Ley, Kurt; and Metzger, Karl Georg. Methods and compositions for treating bacterial infection employing imines. 3,856,957, Cl. 424-246.000.
Senkyrik, Frank, to Lee, Raymond, Organization, Inc., The. Wheel straightener. 3,855,831, Cl. 72-32.000.
Sentou, Bernard, to Etablissements Carpano & Pons. Safety ski binding. 3,856,317, Cl. 280-11.35t.
Service d'Exploitation Industrielle des Tabacs et des Allumettes: *See*—
Gouy, Jean-Claude, 3,856,227.
Seversky Electronatom Corporation: *See*—
DeSeversky, Alexander P., 3,856,476.
Shanks, Howard R.: *See*—
Hahn, Paul B.; Johnson, Dennis C.; Shanks, Howard R.; and Wechter, Margaret A., 3,856,634.
Sharland, Ian J.: *See*—
Rabett, Reginald George Edward, 3,856,107.
Shavel, John, Jr.: *See*—
Zinnes, Harold; Sircar, Jagadish C.; and Shavel, John, Jr., 3,856,784.
Shaw, Donald George, to Shaw, Trew & Smith Limited. Mobile load handling machines. 3,856,149, Cl. 212-38.000.
Shaw, Trew & Smith Limited: *See*—
Shaw, Donald George, 3,856,149.
Sheaf, James E., to Rollyson Aluminum Products. Threshold strip for sliding doors having replaceable bearing track. 3,855,732, Cl. 49-425.000.
Shedyak, George Alexander: *See*—
Seinfeld, Marc Michael; and Shedyak, George Alexander, 3,856,657.
Sheldon, E. H., and Company: *See*—
Carlson, Arthur W.; and Blodee, Leif, 3,856,372.
Shell Oil Company: *See*—
Adair, James C.; and Luke, Robert R., 3,856,095.
Fan, Hsing Y., 3,856,897.
Hunter, Susan E.; Boyce, Clive B. C.; Armitage, Brian P.; Haken, Pieter Ten; and Wagner, Willem M., 3,856,976.
McDermott, David C., 3,856,570.
Nozaki, Kenzie, 3,856,856.
Rocklin, Albert L., 3,856,589.
Shema, Bernard F.: *See*—
Brink, Robert H., Jr.; Shema, Bernard F.; and Swered, Paul, 3,856,961.
Sherman, Guy J. Contact lens holder and storage container useful in a method for cleaning contact lenses. 3,856,571, Cl. 134-34.000.
Shida, Shigeru: *See*—
Kitanosono, Hidehiro; Kubo, Takeaki; and Shida, Shigeru, 3,855,830.
Shields, Theodore Curtis: *See*—
Papa, Anthony Joseph; Proops, William Robert; and Shields, Theodore Curtis, 3,856,865.
Shikishima Tipton Mfg., Co., Ltd.: *See*—
Kobayashi, Hisamine, 3,855,740.
Shimahara, Hideo: *See*—
Sugiyama, Noboru; and Shimahara, Hideo, 3,856,945.
Shimizu, Isoo: *See*—
Takahashi, Naoya; Aida, Yoshiaki; and Shimizu, Isoo, 3,856,740.
Shimozato, Joji; Umeno, Masashi; and Yabuta, Shiro, to Japan Synthetic Rubber Co. Ltd. Butadiene rubber composition. 3,856,729, Cl. 260-23.70m.
Shimura, Yasuo: *See*—
Hashimoto, Masafumi; and Shimura, Yasuo, 3,856,588.
Shinomura, Toshihiko. Waxy composition for preventing rubbery substance form ozone deterioration at medium and/or low temperature. 3,856,731, Cl. 260-28.50b.
Shionogi & Co., Ltd.: *See*—
Mackawa, Hideyuki; and Nakanishi, Masaichi, 3,856,138.
Satoh, Daisuke, 3,856,944.
Shioyama, Osamu: *See*—
Taninaka, Kuniaki; Shioyama, Osamu; and Murata, Kikuzo, 3,856,814.
Shirai, Kiyoshi, to Kokusan Denki Co., Ltd. Breakerless ignition systems. 3,855,985, Cl. 123-148.00c.
Shirai, Shogo; and Uchida, Haruo, to Kabushiki Kaisha Akashi Seisakusho. Electron gun for electron irradiation equipment. 3,857,055, Cl. 313-237.000.
Shizuki Electrical Mfg. Co., Ltd.: *See*—
Yagitani, Takayuki, 3,857,073.
Shorrock, Stanley. Backed tufted carpet and method of manufacturing the same. 3,856,596, Cl. 156-72.000.
Showa Denko Kabushiki Kaisha: *See*—
Yamaura, Tokuharu; Takeda, Masayuki; Tajima, Koi; and Koike, Norio, 3,856,926.
Showa Denko K.K.: *See*—
Sato, Wasuke; Yamamoto, Seijiro; Kuwabara, Nobuaki; and Adachi, Shigeru, 3,856,025.
Ueshima, Takashi; Kobayashi, Shoichi; and Matsuoka, Masami, 3,856,758.
Showa Densen Denran Kabushiki Kaisha: *See*—
Nikaido, Teruji; Haga, Kaoru; Sugiyama, Norio; and Fujiwara, Yasutaka, 3,857,071.
Shrier, Adam L.; and Danckwerts, Peter V., to Exxon Research and Engineering Company. Promoting scrubbing of acid gases. 3,856,921, Cl. 423-228.000.
Shubert, Roland H. Method for treatment of coal washery waters. 3,856,668, Cl. 210-21.000.
Shull, Robert W.: *See*—
Sweeney, Roy P.; and Shull, Robert W., 3,855,756.
Siclari, Francesco; and Rossi, Pietro Paolo, to Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A. Method for the production of aldehydic acids. 3,856,833, Cl. 260-413.000.
Siddall, John B.: *See*—
Henrick, Clive A.; and Siddall, John B., 3,856,866.
Sidler, Marc Jean, to S.K.F. Compagnie d'Applications Mecaniques. Hardness testing machine. 3,855,848, Cl. 73-81.000.
Siegelman, Abe; Quoss, Robert N.; and Pawlak, Raymond M., to Beckman Instruments, Inc. Low-pressure inking system and ink therefor. 3,856,536, Cl. 106-22.000.
Siegla, Donald C., to General Motors Corporation. Regenerator seal. 3,856,077, Cl. 165-9.000.
Siemens Aktiengesellschaft: *See*—

Franke, Kurt; and Finkenzeller, Johann, 3,857,039.
Groppel, Dieter, 3,856,573.
Heywang, Hermann; Kobale, Manfred; Preissinger, Karl-Heinz; Ristow, Dietrich; and Wehnelt, Ulrich, 3,857,074.
Muench, Heinz, 3,856,375.
Peche, Gerhard, 3,857,005.

Signetics Corporation: *See—*
Grebene, Alan B., 3,857,110.

Sigworth, Harrison W.: *See—*
Smith, Calvin S., Jr., 3,856,631.

Sill, Arthur D.: *See—*
Fleming, Robert W.; and Sill, Arthur D., 3,856,789.

Silveston, Peter L.; and Hudgins, Robert R. Acceleration of oxidation processes over vanadia catalysts. 3,856,927, Cl. 423-533.000.

Simane, Zdenek: *See—*
Dahm, Johann; Borck, Joachim; Nowak, Herbert; Simane, Zdenek; and Kayser, Detlev, 3,856,812.

Simeth, Claus, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Ink fountain blade for printing presses. 3,855,927, Cl. 101-350.000.

Simitrov, Lyudmil Vasilev. Driven rotatable and reciprocable spindle operating in cycles of short duration. 3,855,869, Cl. 74-22.00r.

Simko, Aladar O., to Ford Motor Company. Fuel injection pump. 3,856,438, Cl. 417-270.000.

Simkus, Vyto: *See—*
Jesevich, John; and Simkus, Vyto, 3,856,162.

Simon, Johannes; Etzbach, Volker; Grimm, Peter; and Ford, Wolfgang, to Linde Aktiengesellschaft. One flow cascade cycle with buffer volume bypass. 3,855,810, Cl. 62-9.000.

Simon, Myron S.: *See—*
Moore, Phylis T.; and Simon, Myron S., 3,856,714.

Simon, Stefan; Wolff, Justus; and Johst, Wolfgang, to Hahn, Carl, Dr., KG. Shape-retaining closure of a tubular package for tampons. 3,856,143, Cl. 206-438.000.

Simpson, William R., to Sandoz-Wander, Inc. Hydroxyalkyl-substituted-amino-quinolines and nitrates thereof. 3,856,796, Cl. 260-288.00r.

Sims, Dewey M., Jr., to Burroughs Corporation. Keyboard switch assembly with improved operating means. 3,856,998, Cl. 200-5.00a.

Sinclair, Archibald R.; Burcher, Ernest E.; and Katzberg, Stephen J., to United States of America, National Aeronautics and Space Administration. Automatic focus control for facsimile cameras. 3,857,031, Cl. 250-201.000.

Singer Company, The: *See—*
Hickey, Roy E.; and Sanderson, William R., 3,856,391.
Tucker, Carl L., 3,856,431.
Weisbord, Leon; and Krupick, Walter J., 3,856,366.
Wurst, John W., 3,855,956.

Sinko, George M., to Underground Products, Inc. Conduit spacer modular construction. 3,856,246, Cl. 248-68.0cb.

Sircar, Jagadish C.: *See—*
Zinnes, Harold; Sircar, Jagadish C.; and Shavel, John, Jr., 3,856,784.

Sirrenberg, Wilhelm; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. 0-(1-Methyl-2 -alkylmercapto-vinyl)-phosphoric acid ester amides. 3,856,892, Cl. 260-948.000.

Sislian, Robert J., to Work Wear Corporation. Laparotomy sheet with extended wing sections. 3,856,005, Cl. 128-132.00d.

Sixt, Marty E.: *See—*
Martin, Lawrence L.; Martin, Ronald C.; and Sixt, Marty E., 3,855,799.

Skaletzky, Louis L.: *See—*
Graham, Boyd E.; and Skaletzky, Louis L., 3,856,965.

S.K.F. Compagnie d'Applications Mecaniques: *See—*
Sidler, Marc Jean, 3,855,848.

Skiiki, Zenya: *See—*
Amagi, Yasuo; and Skiiki, Zenya, 3,856,574.

Skobel, Max, to Royle, John & Sons. Measurement of dimension of elongated material during its continuous vulcanization. 3,856,595, Cl. 156-64.000.

Skrivan, Joseph Francis; and Chase, John Donald, to American Cyanamid Company. Process for the beneficiation of titaniferous ores utilizing hot wall continuous plasma reactor. 3,856,918, Cl. 423-69.000.

Skrypek, John P.; and Whelan, Edward J., to Sun Chemical Corporation. Overvarnish unit for continuous-motion decorating apparatus. 3,855,967, Cl. 118-230.000.

Skubic, Leroy F.; and Blozis, Peter P., to Paltier Corporation, The. Protective base plates for pallet tiering frames. 3,855,944, Cl. 108-55.000.

Skuttle Manufacturing Company: *See—*
Yeagle, Richard J., 3,856,279.

Sletten, Andreas M.; and Cookson, Alan H., to Westinghouse Electric Corporation. Adherent coating for captivating small particles in gas-insulated electrical equipment. 3,856,978, Cl. 174-14.000.

Sloan Valve Company: *See—*
Billeter, Henry R., 3,855,639.
Filliung, Jacques J.; Nelson, Axel B.; and Billeter, Henry R., 3,855,640.

Small, Fred: *See—*
Allen, Archelaius Dawson; and Small, Fred, 3,856,356.

Smeggil, John G.; and Charles, Richard J., to General Electric Company. Air-stable magnetic materials and method. 3,856,580, Cl. 148-105.000.

Smeggil, John G.; and Charles, Richard J., to General Electric Company. Annealing air-stable magnetic materials having superior magnetic characteristics and method. 3,856,581, Cl. 148-105.000.

Smeggil, John G.; and Charles, Richard J., to General Electric Company. Fabrication of matrix bonded transition metal-rare earth alloy magnets. 3,856,582, Cl. 148-105.000.

Smith, Calvin S., Jr., 1/3 each to Sigworth, Harrison W. and Finical, Thomas N., Jr. Process and apparatus for separating water from non-volatile solutes. 3,856,631, Cl. 203-111.000.

Smith, Ernest L., to Phillips Petroleum Company. Two-piece shield. 3,856,314, Cl. 277-1.000.

Smith, Frederick W.: *See—*
Seifert, Lester H.; Powers, Raymond P.; Schmidt, William M.; Thorwaldsen, Stanley E.; Smith, Frederick W.; McElroy, David C.; and Dunton, Roy P., 3,855,763.

Smith, Jay E., to United States of America, Atomic Energy Commission, mesne. Single-lamp ground detector for converter-inverter power supplies. 3,857,070, Cl. 317-18.00r.

Smith, Jay G., Jr.; and Joyce, Jerry R., to Reynolds, R. J., Tobacco Company. Pepper harvester. 3,855,760, Cl. 56-13.200.

Smith, Louis P.: *See—*
Peters, Beldon A.; Smith, Louis P.; and Landrum, Aubrey O., 3,856,677.

Smith, Melvin Dee: *See—*
Genshaw, Marvin Alden; and Smith, Melvin Dee, 3,856,649.

Smith, Stanley D.; and Hamilton, Stephen B., Jr., to General Electric Company. Alkanedioxy titanium chelates. 3,856,839, Cl. 260-429.500.

SmithKline Corporation: *See—*
Bender, Paul E.; and Loev, Bernard, 3,856,822.
Blackburn, Dale W.; Devenney, Robert F.; and Mlynarski, John J., 3,856,704.
Loev, Bernard, 3,856,820.
Loev, Bernard, 3,856,821.
Loev, Bernard, 3,856,823.

Smithwick, Edward L., Jr., to Lilly, Eli, and Company. Process for preparing a protected arginine. 3,856,848, Cl. 260-482.00c.

Snarey, Michael: *See—*
Danilewicz, John Christopher; Kemp, John Edward Glyn; Snarey, Michael; and Wright, James Robert, 3,856,794.

Snedeker, Herbert Elmer. Reattachable checks. 3,856,332, Cl. 283-57.000.

Snell, George J.: *See—*
Sze, Morgan C.; and Snell, George J., 3,856,675.

Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A.: *See—*
Siclari, Francesco; and Rossi, Pietro Paolo, 3,856,833.

Sniderman, Ken E. Electrical circuit having an odds selector for a game of chance. 3,856,310, Cl. 273-138.00a.

Snowman, Lawrence R.: *See—*
Noble, Milton L.; and Snowman, Lawrence R., 3,856,406.

Snyder, Harry C., Jr., to Aluminum Company of America. Recovery of gallium oxide from solutions. 3,856,920, Cl. 423-122.000.

Snyder, Richard Paul: *See—*
Teague, Roger W.; and Snyder, Richard Paul, 3,856,216.

Snyder, Ronald R., to United States of America, Air Force. Cartridge link guide assembly. 3,855,686, Cl. 29-208.00e.

Sobel, Jack: *See—*
Turner, Robert A., 3,856,941.

Sobey, Albert J.; McQueen, Norman; and Larsen, Robert R., to Otis Elevator Company. Vehicle body construction. 3,856,106, Cl. 180-116.000.

Societa' Italiana Resine S.I.R. S.p.A.: *See—*
Cocuzza, Giacchino; and Calcagno, Benedetto, 3,856,484.
Messina, Giuseppe; Lorenzoni, Loreno; and Bertolini, Natale, 3,856,878.

Societa' Per La Strada Guidata S. R. L.: *See—*
Peveraro, Cesare, 3,855,938.

Societe Anonyme D.B.A.: *See—*
Carre, Jean-Jacques, 3,855,905.
Mangold, James, 3,856,364.

Societe Anonyme D.E.A.: *See—*
Papiau, Guy, 3,855,797.

Societe Anonyme des Usines Chausson: *See—*
Chartet, Andre, 3,855,682.

Societe Anonyme dite: L'Oreal: *See—*
Kalopissis, Gregoire; and Bugaut, Andree, 3,856,810.

Societe anonyme dite: Orsymonde: *See—*
Blonde, Pierre, 3,855,712.

Societe Anonyme Francaise du Ferodo: *See—*
Rist, Michel, 3,855,790.

Societe Anonyme l'Eclairage Technique: *See—*
Adam, Marie Henri Hubert, 3,857,030.

Societe Anonyme Produits Chimiques Ugine Kuhlmann: *See—*
Texier, Nicole; Cuer, Jean-Pierre; and Gabriel, Michel, 3,856,917.

Societe Anonyme: Produits Chimiques Ugine Kuhlmann: *See—*
Lefrancois, Robert; Denoyers, Jacques; and Gabriel, Michel, 3,856,916.

Societe d'Exploitation des Brevets Neiman: *See—*
Lipschutz, Paul, 3,855,829.

Societe en Commandite par Actions dite: Adolphe et Andre Caen: *See—*
Hirsch, Jean-Jacques; Mayeur, Eugene; and Mayeur, Jacky, 3,856,055.

Societe en nom collectif Science Union et Cie Societe Francaise de Recherche Medicale Suresnes: *See—*
Beregi, Laszlo; Hugon, Pierre; and Le Douarec, Jean-Claude, 3,856,857.

Societe Lignes Telegraphiques et Telephoniques: *See—*
De Meux, Patrick Delaage; and Gourdon, Claude, 3,857,048.
Deschamps, Andre; and Faye, Georges, 3,855,691.

Societe Nationale des Petroles d'Aquitaine: *See—*
Sahores, Jean, 3,857,038.

Solymos, Frederick, to Westinghouse Electric Corporation. Elevator system. 3,856,117, Cl. 187-95.000.

Solymosi, Frank. Wheeled board toy assembly. 3,856,321, Cl. 280-87.040.

Sommer, Karl-Heinz: *See—*
Borchert, Edgar; and Sommer, Karl-Heinz, 3,856,586.

Sonnenberg, Fred Max: *See—*
Collette, John Wilfred; Ro, Rolland Shih-Yuan; and Sonnenberg, Fred Max, 3,856,765.

Sonnenschein, Charles M.: *See—*
United States of America, National Aeronautics and Space Administration, 3,856,402.

Sonoco Products Company: *See—*
Fox, James D.; Norman, Earl P., Jr.; and Sansbury, Jerry F., 3,856,179.

Sony Corporation: *See—*
Inoue, Takuji, 3,856,525.

Soodak, Charles I.: *See—*
Cullis, Herbert M.; Fordham, Willard E.; and Soodak, Charles I., 3,856,470.

Soros, Paul. Shipside cargo conveyance device. 3,856,159, Cl. 214-14.000.

Southwest Research Institute: *See—*
Mallow, William A.; Owen, Richard A.; and Baker, Ethelbert J., Jr., 3,856,539.

Souvenir Incorporated: *See—*
Oltmann, Fay W., 3,856,420.

Spadaro, James J.: *See—*
Lambou, Madeline G.; and Spadaro, James J., 3,856,700.

Spairani, Luciano. Fluid flow control device. 3,855,798, Cl. 60-585.000.

Spanel, Abram Nathaniel. Hair cutters. 3,855,695, Cl. 30-30.000.

Spanel, Abram Nathaniel. Hair cutters. 3,855,696, Cl. 30-30.000.

Sparks, Byran: *See—*
Fontana, C. Michael; and Sparks, Byran, 3,856,760.

Spaulding, Forrest D.: *See—*
Bresson, Clarence R.; and Spaulding, Forrest D., 3,856,732.

Sperry Rand Corporation: *See—*
Lonnemo, Kurt R., 3,856,436.
Taggart, James A., 3,856,128.

Spicer, Denis Frank, to Texas Instruments, Incorporated. Electron-beam patterning system for use in production of semiconductor devices. 3,857,041, Cl. 250-492.000.

Splitt, Theodore B.: *See—*
Baxter, Bobby G.; and Splitt, Theodore B., 3,856,330.

Squibb, E. R., & Sons, Inc.: *See—*
Breuer, Hermann, 3,856,785.
Denzel, Theodor; and Hoehn, Hans, 3,855,675.
Hauck, Frederic Peter; and Cimarusti, Christopher Michael, 3,856,818.
Hoehn, Hans; and Denzel, Theodor, 3,856,799.
Jackson, Ivan, 3,856,954.
Stiller, Eric T.; Levine, Seymour D.; Principe, Pacifico A.; and Diassi, Patrick A., 3,856,977.
Yale, Harry Louis; and Petigara, Ramesh B., 3,856,781.
Yale, Harry Louis; and Petigara, Ramesh B., 3,856,782.
Yale, Harry Louis; and Petigara, Ramesh B., 3,856,801.

Srda, Lubomir: *See—*
Prosecky, Jaroslav; and Srda, Lubomir, 3,855,823.

St. Andre, Arthur F.: *See—*
Wake, John A.; and St. Andre, Arthur F., 3,857,079.

St. Laurent, Arthur. Compressor control for refrigeration system. 3,855,813, Cl. 62-196.000.

Stabilus GmbH: *See—*
Freitag, Herbert, 3,856,287.

Stalter, Robert J., Sr., to Goodyear Tire & Rubber Company, The. Method of making a mattress and said mattress. 3,855,653, Cl. 5-351.000.

Stamicarbon B.V. V.: *See—*
Deumens, Johannes J. M.; Verheijen, Egidius J. M.; and Thoma, Jozef A., 3,856,819.

Stanbank, Derek James; Leigh, Roland Albert; and Gibson, Geoffrey Moorhouse, to British Oxygen Company Limited, The, mesne. Compositions containing dithionites. 3,856,696, Cl. 252-188.000.

Stanford, William L.: *See—*
Higginbotham, Roy F.; Melugin, Leland A.; and Hendrickson, Donald Carl, 3,857,020.

Stang, Karl H., to General Motors Corporation. Sewing machine apparatus. 3,855,955, Cl. 112-152.000.

Stangel, Frank J., to Fingerhut Corporation. Marketing device. 3,856,115, Cl. 186-1.00r.

Stankewitz, Hans-Werner: *See—*
Hartmann, Horst; and Stankewitz, Hans-Werner, 3,856,400.

Stansbury, Patrick H. Bell and spigot PVC pipe joint. 3,856,315, Cl. 277-188.000.

Stark, Richard M.; and Beachem, Ronald G., to Business Electronics, Inc. Controlled access systems. 3,857,018, Cl. 235-61.70b.

Statkus, Frank D. Rotary internal-combustion engine. 3,855,977, Cl. 123-43.00c.

Stauffer Chemical Company: *See—*
MacDonald, Alan A., 3,856,793.

Stayton, Leroy M.; and Herling, Theodore L., to United States of America, Navy, Bone mill. 3,856,219, Cl. 241-263.000.

Steele, Wallace Lee Roy, to Unites States of America, Army. Force transmitting system. 3,856,289, Cl. 267-154.000.

Stegelman, Albert F.; and Michalski, Arnold, to Phillips Fiber Corporation. Method of repairing spinnerettes. 3,857,012, Cl. 219-69.00m.

Steigerwald, John R.; Rasmussen, John P.; and Crapanzano, Angelo T., to Goodyear Tire & Rubber Company, The. Anti-skid control system for aircraft. 3,856,365, Cl. 303-21.0be.

Stein, William W.: *See—*
Moon, Ronald L.; Stein, William W.; and Warnock, Donald, 3,856,585.

Steinberg, Meyer; Colombo, Peter; and Farber, Gerald, to United States of America, Atomic Energy Commission. Glass polymer composites. 3,856,054, Cl. 138-174.000.

Steiner, H., Limited: *See—*
Steiner, Hubert, 3,855,878.

Steiner, Hubert, to Steiner, H., Limited. Transmission systems. 3,855,878, Cl. 74-665.00q.

Steinman, Martin, to Schering Corporation. 1-Substituted-2-thio-1H-1,4-benzodiazepines. 3,856,787, Cl. 260-243.00r.

Stella, Joseph A.: *See—*
Wray, William R.; and Stella, Joseph A., 3,856,387.

Stella, Joseph A., to Polaroid Corporation. Pull-strip mechanism for multipurpose film cassettes. 3,856,390, Cl. 352-130.000.

Stephenne, Hubert: *See—*
Deschenes, Pierre A.; Stephenne, Hubert; and Villeret, Michel, 3,857,111.

Sterba, Josef, to Vyzkumny a vyvojovy ustav Zavody vseobecneho strojirenstvi. Tape-positive yarn feed. 3,855,821, Cl. 66-132.000.

Sterling Drug Inc.: *See—*
Ackerman, James H., 3,856,853.
Bair, Robert K., 3,856,800.

Stevenson, James S. Storage tank. 3,856,274, Cl. 259-109.000.

Stewart, Arthur H. Safety accessories for ladders. 3,856,112, Cl. 182-172.000.

Stewart, James R.: *See—*
Lutts, Carlton G.; and Stewart, James R., 3,856,294.

Stiller, Eric T.; Levine, Seymour D.; Principe, Pacifico A.; and Diassi, Patrick A., to Squibb, E. R., & Sons, Inc. Fluorene-2-acetic acids and derivatives, composition and method of using. 3,856,977, Cl. 424-317.000.

Stillman, Neil W.: *See—*
Lieb, Donald F.; and Stillman, Neil W., 3,856,642.

Stockman, James R.: *See—*
Dowidchuk, George; and Stockman, James R., 3,856,258.

Stoelting Brothers Company: *See—*
Born, Billy Leon, 3,856,273.

Stoepel, Kurt: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,856,798.

Straalsund, Jerry L.: *See—*
Bates, John F.; Holmes, James J.; Paxton, Michael M.; and Straalsund, Jerry L., 3,856,517.

Strader, James W. Fishing lure. 3,855,721, Cl. 43-42.320.

Strain, Donny R.; and Martin, Daniel B., to Scott Environmental Technology, Inc. Dynamic gas blending. 3,856,033, Cl. 137-3.000.

Strik, Francis Bernardus; and Van Soerland, Nicolaas Augustinus Joseph, to U.S. Philips Corporation. Method of electrophotographically manufacturing a television material screen using hygroscopic. 3,856,518, Cl. 96-1.00r.

Strong, Clifford H. G., to Uniroyal Ltd. Process for the purification and concentration of solutions derived from marine algae. 3,856,569, Cl. 127-34.000.

Struthers, Beacher. Building block. 3,855,751, Cl. 52-603.000.

Stuber, Fred A.: *See—*
Ulrich, Henri; Stuber, Fred A.; and Broggi, Allen J., 3,856,523.

Stuemky, Robert E.; and George, Gene H., to Gates Rubber Company, The. Flexible shaft. 3,855,817, Cl. 64-2.00r.

Stumpf, Howard C.; and Laskey, Daniel A. Nut retaining socket wrench. 3,855,883, Cl. 81-125.000.

Sturt, Alan Charles; and Williams, Richard Harvey, to Vinyl Products Limited, mesne. Polymerisation process for grafting vinyl chloride on ethylene-vinyl acetate copolymer. 3,856,733, Cl. 260-29.6rb.

Sturt, Alan Charles. Polymerisation process. 3,856,767, Cl. 260-92.80r.

Subsea Equipment Associates Limited: *See—*
Le Therisien, Louis G., 3,855,806.

Suda, Michael: *See—*
Raffelson, Harold; and Suda, Michael, 3,856,824.

Suddeutsche Kalkstickstoff-Werk Aktiengesellschaft: *See—*
Aignesberger, Alois; and Rosenbauer, Hans-Gunter, 3,856,542.

Sugier, Andre; and Miquel, Jean, to Institut Francais du Petrole des Carburants et Lubrifiants. Reforming using homogeneous platinum-iridium catalyst. 3,856,661, Cl. 208-138.000.

Sugimura, Yuriko: *See—*
Yamazaki, Shumpei; Kagawa, Ichiro; and Sugimura, Yuriko, 3,856,587.

Sugiyama, Noboru; and Shimahara, Hideo, to Kabushiki Kaisha Shimizu Manzo Shoten. Method of reducing serum cholesterol level with extract of Konjac mannan. 3,856,945, Cl. 424-195.000.

Sugiyama, Norio: *See—*
Nikaido, Teruji; Haga, Kaoru; Sugiyama, Norio; and Fujiwara, Yasutaka. 3,857,071.

Suh, John T.: *See—*
Schnettler, Richard A.; and Suh, John T., 3,856,854.

Sumitomo Chemical Company: *See—*
Takagi, Kazumi; Murakami, Masahiro; and Manabe, Kuniyoshi, 3,856,882.

Sumitomo Chemical Company, Limited: *See—*
Mori, Kenjiro; Ikebe, Shigueaqui; Hirooka, Masaaki; and Kato, Takashi, 3,856,685.

Sumitomo Rubber Industries, Ltd.: *See—*
Imabori, Junpei; Kuzuoka, Takeshi; and Mori, Atsuhiko, 3,855,842.

Summers, Robert H.: *See—*
United States of America, National Aeronautics and Space Administration, 3,855,873.

Summers, Robert L., 40% to Mason, William D., Jr. Two shell gravity oil-water separator. 3,856,682, Cl. 210-294.000.

Sun Chemical Corporation: *See—*
Skrypek, John P.; and Whelan, Edward J., 3,855,967.

Sun Oil Company of Pennsylvania: *See—*
Chang, Robert C. C., 3,856,486.

Sund, Erik Ivar, to Igloo-Flex AB. Flexible wall section, in particular for heating or refrigerating chambers. 3,856,072, Cl. 160-84.00r.

Sundstrand Corporation: *See—*
Pollman, Frederic W.; Reynolds, David W.; Ross, William A.; and Schauer, George A., 3,855,793.

Suovaniemi, Osmo A. Multiple pipette. 3,855,868, Cl. 73-425.600.

Sushkin, Nikolai Gavrilovich: *See—*
Prudkovsky, Garald Petrovich; Khotina, Alexandra Vasilievna; Sushkin, Nikolai Gavrilovich; Kopnev, Lev Nikolaevich; and Merzlikin, Sergei Filippovich, 3,857,014.

Susuki, Rinnosuke; Hoshi, Hiroshi; Satto, Jiro; Takano, Koichi; and Kosikawa, Kiyoshi, to Lion Fat and Oil Co., Ltd. Foamed materials of synthetic resin and laminations comprising the same. 3,856,614, Cl. 161-159.000.

Susuki, Rinnosuke; Hoshi, Hiroshi; Saito, Jiro; Murakami, Keiichi; and Yamada, Hisashi, to Lion Fat & Oil Co., Ltd. Thermoplastic composition for molding. 3,856,746, Cl. 260-42.240.

Sutures, Inc.: *See—*
Esemplare, Pascal E.; and Beeferman, Dennis, 3,856,561.

Suvanto, Antti; and Fries, Ake, to Aktiebolaget Asea-Atom. Blocking arrangement for mechanism for handling fuel assemblies in nuclear reactors. 3,856,621, Cl. 176-30.000.

Suzukawa, Yuichi; Kono, Hisashi; and Kuribayashi, Atushi, to UBE Industries, Ltd. Apparatus for pelletizing powdered solid substance in a fluidized bed. 3,856,441, Cl. 425-7.000.

Suzuki, Hidenori; Maeda, Katsumi; Nakatani, Keiji; and Ishii, Kenjiro, to Minolta Camera Kabushiki Kaisha. Viewing and electrostatic copying machine. 3,856,397, Cl. 355-45.000.

Suzuki, Katsumi: *See—*
Ishido, Yoshiharu; Yoshino, Teruo; Komura, Hajime; Suzuki, Katsumi; Yamasaki, Akihiro; and Okutsu, Masaru, 3,856,777.

Suzuki, Kazaburo: *See—*
Seki, Toshio; Suzuki, Kazaburo; and Matsuzaki, Takashi, 3,856,727.

Svenska Traforskningsinstitutet: *See—*
Hill, Jan Erik; Eriksson, Erik Lennart; and Lennartsson, Mats, 3,856,408.

Swain, Michael James: *See—*
Duke, Dennis; Swain, Michael James; and Cracknell, Alan, 3,856,350.

Swallert, Sven Arild. Open-topped foldable receptacle. 3,856,064, Cl. 150-49.000.

Swanson, Allan R., to Clark Equipment Company. Vehicle braking system. 3,856,361, Cl. 303-6.00r.

Swasey, Warner R., Company, The: *See—*
Fournier, Roger H., 3,855,734.

Swatko, Albert, to Royer Foundry and Machine Co. Feeding assist means for a wood chipper. 3,856,212, Cl. 241-56.000.

Sweeney, Roy P.; and Shull, Robert W., to Owens-Illinois, Inc. Load stabilization. 3,855,756, Cl. 53-26.000.

Sweeton, David C., to Prince Manufacturing, Inc. Ball throwing machine. 3,855,988, Cl. 124-11.00r.

Swered, Paul: *See—*
Brink, Robert H., Jr.; Shema, Bernard F.; and Swered, Paul, 3,856,961.

Swift, Gilbert; Moore, William M.; and Milberger, Lionel J., to Tracker, Martin, Corporation. Method and apparatus for testing bladed rotors. 3,856,410, Cl. 356-167.000.

Swiss Aluminium Ltd.: *See—*
Kugler, Tibor; and Rieger, Hans Wolfhart, 3,856,650.

Syva Corporation: *See—*
Schneider, Richard S.; and Ullman, Edwin F., 3,856,469.

Sze, Morgan C.; and Snell, George J., to Lummus Company, The. Coal liquefaction. 3,856,675, Cl. 210-73.000.

Szmuszkovicz, Jacob, to Upjohn Company, The. 1,6-Disubstituted-4H-s-[4,3-a]benzodiazepines. 3,856,802, Cl. 260-296.00t.

Tabalba, Camilo Manasala: *See—*
Lawson, Anthony Newton; and Tabalba, Camilo Manasala, 3,856,982.

Tada, Siro, to Matsushita Electric Industrial Co., Ltd. Channel indicator. 3,855,963, Cl. 116-124.100.

Tadlock, Guy M.: *See—*
Harmon, Gardy R.; Norman, John D.; and Tadlock, Guy M., 3,856,218.

Taggart, James A., to Sperry Rand Corporation. Printer variable form length controller. 3,856,128, Cl. 197-133.00r.

Taiheiyo Coal Mining Co., Ltd.: *See—*
Nakajima, Shigeo, 3,855,805.

Tajima, Koi: *See—*
Yamaura, Tokuharu; Takeda, Masayuki; Tajima, Koi; and Koike, Norio, 3,856,926.

Takagi, Kazumi; Murakami, Masahiro; and Manabe, Kuniyoshi, to Sumitomo Chemical Company. Process for producing 2,5-dimethyl 2,4-hexadiene. 3,856,882, Cl. 260-681.00r.

Takahashi, Nagashige; and Oouchi, Teruo. Method of protecting a bundle of flexible optical fibers. 3,855,897, Cl. 87-1.000.

Takahashi, Naoya; Aida, Yoshiaki; and Shimizu, Isoo, to Nippon Petrochemicals Co. Ltd. Polysulfide rubber sealant composition. 3,856,740, Cl. 260-33.6aq.

Takahashi, Reijiro; Kanemoto, Kazuo; and Ito, Toshikatu, to Hitachi, Ltd. Device for controlling coolant pressure in evaporator. 3,855,836, Cl. 62-217.000.

Takahashi, Syozo: *See—*
Sakurai, Masayuki; Takahashi, Syozo; and Kikuno, Hideo, 3,856,132.

Takahashi, Yasuo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Wide-angle lens assembly of retrofocus type. 3,856,385, Cl. 350-214.000.

Takamatsu, Ikuo, to Yoshida Kogyo Kabushiki Kaisha. Concealed zip fasteners. 3,855,672, Cl. 24-205.10c.

Takano, Koichi: *See—*
Susuki, Rinnosuke; Hoshi, Hiroshi; Satto, Jiro; Takano, Koichi; and Kosikawa, Kiyoshi, 3,856,614.

Takao, Michio: *See—*
Kolshi, Hitoshi; Takao, Michio; Oda, Yasuhiro; Iguchi, Hideo; and Kohase, Shigeru, 3,856,759.

Takata, Toshihiko: *See—*
Tanaka, Osamu; Yamamoto, Takaaki; and Takata, Toshihiko, 3,856,568.

Takayama, Katsuki, to Aisin Seiki Kabushiki Kaisha. Pressure control valve. 3,856,047, Cl. 137-625.610.

Takeda Chemical Industries, Ltd.: *See—*
Hiraga, Kentaro; Yoshioka, Kouichi; Golo, Giichi; Nakayama, Ryo; and Masuoka, Michio, 3,856,829.
Yokotani, Hajime; Miyamoto, Masuo; and Murata, Tadakazu, 3,856,911.

Takeda, Hideomi; and Kawasaki, Harumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Automatic focusing device. 3,856,407, Cl. 356-123.000.

Takeda, Hisami: *See—*
Fujimoto, Keimei; Hirano, Masachika; Takeda, Hisami; and Ooba, Shigehiro, 3,856,972.

Takeda, Masayuki: *See—*
Yamaura, Tokuharu; Takeda, Masayuki; Tajima, Koi; and Koike, Norio, 3,856,926.

Takematsu, Tetsuo: *See—*
Tsuchiya, Hideshi; Takematsu, Tetsuo; Hasegawa, Yoichi; and Furushima, Masakazu, 3,856,850.

Takeuchi, Tetsuo: *See—*
Moriguchi, Shigeru; Takeuchi, Tetsuo; and Saito, Yuzi, 3,855,687.

Takeuchi, Tomio: *See—*
Umezawa, Hamao; Okami, Yoshiro; Takeuchi, Tomio; and Ishiyama, Tetsuji, 3,856,969.

Takizawa, Muneto: *See—*
Maeda, Kazuo; Takizawa, Muneto; and Saito, Yuzi, 3,856,130.

Tamura, Mituo: *See—*
Tateisi, Hiromiti; and Tamura, Mituo, 3,855,735.

Tanaka, Osamu; Yamamoto, Takaaki; and Takata, Toshihiko, to Nippon Steel Corporation. Method for forming an insulating film on an oriented silicon steel sheet. 3,856,568, Cl. 117-70.00b.

Tanaka, Susumu: *See—*
Kushima, Teizo; Tanaka, Susumu; and Ogawa, Masaya, 3,856,396.

Taniguchi, Toshinori: *See—*
Yoshizawa, Toshio; Yamada, Yasuo; Taniguchi, Toshinori; Kose, Tatsuo; Ohchi, Kazuo; and Hori, Kiyokazu, 3,855,771.

Taninaka, Kuniaki; Shioyama, Osamu; and Murata, Kikuzo, to Nihon Nohyaku Co., Ltd. Dithiolan-2-ylidenemalonates. 3,856,814, Cl. 260-327.00m.

Tann, Lewis H.; Carroll, Robert J.; and Lipke, Donald L., to Candid Logic, Inc. Self-actuated digital location sensor. 3,855,708, Cl. 33-169.00r.

Tarman, Paul B.; and Massey, Lester G., to Consolidated Natural Gas Service Co. Inc. Oxygen production process. 3,856,928, Cl. 423-579.000.

Tate & Lyle Limited: *See—*
Imrie, Frazer Keith Elliott, 3,856,625.

Tateishi, Teizabro; Murase, Koichi; and Iwanaga, Yukio, to Fuji Oil Company, Ltd. Process for preparing hard butter. 3,856,831, Cl. 260-409.000.

Tateisi, Hiromiti; and Tamura, Mituo, to Toyo Bearing Manufacturing Company Limited. Dimensional control gauge for internal grinders. 3,855,735, Cl. 51-165.00r.

Taub, Bernard, to Allied Chemical Corporation. Molded flexible polyurethane foams. 3,856,718, Cl. 260-2.5aq.

Taylor, Dermot B. Apparatus and method for wide area, dark field, high resolution autoradiography. 3,856,398, Cl. 355-63.000.
Taylor, Thomas W.; Ciuffini, Anthony J.; and Gerace, Paul L., to Xerox Corporation. Strippable overcoating for improved xerographic plates. 3,856,548, Cl. 117-6.000.
Teague, Roger W.; and Snyder, Richard Paul, to General Signal Corporation. System and apparatus for cleaning bar grid. 3,856,216, Cl. 241-46.00r.
Technical Processing, Inc.: *See—*
Aron, Erwin, 3,856,547.
Teijin Limited: *See—*
Kishida, Takashi; and Kadokura, Sadao, 3,855,676.
Sakai, Kouichi; Tokai, Yoshiaki; and Matsunaka, Sadayoshi, 3,856,884.
Yamashita, Gentaro; and Yamamoto, Kiyoshi, 3,856,855.
Tektronix, Inc.: *See—*
Larson, Lester L., 3,857,059.
Telesco Brophey Limited: *See—*
Schafer, Josef, 3,856,032.
Weber, Heinz, 3,856,031.
Tennakoon, Charles Lionel Kasturiratne: *See—*
Fleischmann, Martin; King, Christopher John Hall; Oldfield, John Wilfred; Plimley, Raymond Ernest; and Tennakoon, Charles Lionel Kasturiratne, 3,856,652.
Tension Structures Co.: *See—*
Huddle, Carl F., 3,856,029.
Tenteris, Ansis U.: *See—*
Fowler, Susan M.; Gottfried, Carolyn Jobst; Mosiniak, Dennis G.; and Tenteris, Ansis U., 3,856,008.
Termex, Inc.: *See—*
Klinger, Josef F.; and Terrill, John Mark, 3,855,866.
Terrill, John Mark: *See—*
Klinger, Josef F.; and Terrill, John Mark, 3,855,866.
Terry, Cameron D. Tile and tile roofing. 3,855,753, Cl. 52-520.000.
Terry, Stanley M.; deceased (by Third National Bank of Springfield, The; executor); and Gray, Alden J., to Maremont Corporation. Rotary electrical switch with bridging contactor. 3,856,999, Cl. 200-11.00k.
Tesch, Gunter Horst: *See—*
Colijn, Johannes Jakobus Vincent; and Tesch, Gunter Horst, 3,856,602.
Texaco Inc.: *See—*
Braden, William B., Jr., 3,856,086.
Haugen, Haakon; and Weetman, David G., 3,856,691.
Homolka, George A. J., 3,855,845.
O'Connor, James J.; and Nolan, John T., Jr., 3,856,724.
Texas Dynamatics, Inc.: *See—*
Jeter, John D., 3,855,742.
Texas Instruments Incorporated: *See—*
Boulanger, Henry J., 3,857,000.
Doherty, John, Jr., 3,856,259.
Fuller, Clyde Rhea; and Ghate, Prabhakar Bhimrao, 3,856,648.
Spicer, Denis Frank, 3,857,041.
Texier, Nicole; Cuer, Jean-Pierre; and Gabriel, Michel, to Societe Anonyme Produits Chimiques Ugine Kuhlmann. Process for treating residual solutions containing hexavalent chromium compounds. 3,856,917, Cl. 423-54.000.
Textron, Inc.: *See—*
Reiland, Bernard F., 3,855,750.
Thaler, Warren A.; Buckley, Donald J., Sr.; and Kennedy, Joseph P., to Exxon Research & Engineering Co. Process for the preparation of high molecular wieght, high unsaturation isobutylene-conjugated diene copolymers. 3,856,763, Cl. 260-80.700.
Theard, Leslie Peter; Peterson, Frank Clyde; Russell, John Lynn, Jr.; and Reierson, Robert L., to Gulf Research & Development Company. Rigid polyethylene foam. 3,856,717, Cl. 260-2.5ha.
Theobold, Erwin F.: *See—*
DuLaney, Lucius B.; and Theobold, Erwin F., 3,856,213.
Thepault, Ernest L.: *See—*
Minet, Roger P.; Debeau, Jean H.; and Thepault, Ernest L., 3,857,114.
Thermo Electron Corporation: *See—*
Dillon, Glenn W., 3,856,473.
Thesier, Patrick A.: *See—*
Kwolek, John P.; and Thesier, Patrick A., 3,856,120.
Thiel, Ralph. Automatic separable fastener. 3,855,674, Cl. 24-230.00a.
Third National Bank of Springfield, The: *See—*
Terry, Stanley M.; and Gray, Alden J., 3,856,999.
Thoma, Jozef A.: *See—*
Deumens, Johannes J. M.; Verheijen, Egidius J. M.; and Thoma, Jozef A., 3,856,819.
Thomas, Charles C., to Mississippi State University Development Foundation, Inc. Thread tensioning device. 3,856,233, Cl. 242-156.000.
Thomas, Evelyn: *See—*
Glickman, Sophie, 3,855,646.
Thomas, Howard M.; and Olszowka, Robert F., to Wurlitzer Company, The. Key assembly. 3,855,894, Cl. 84-423.000.
Thomas, Jacob E. Playground assembly set. 3,855,748, Cl. 52-585.000.
Thompson, Charles R.; and Hidalgo, John, to Cutter Laboratories, Inc. Use of injectable compositions of the (plus)-optical isomer of the alpha racemate of 2-(2-ethyl-2-phenyl-1,3-dioxolan-4-yl)piperidine to control pain. 3,856,963, Cl. 424-267.000.
Thompson, David M.: *See—*
Hynes, Frank R.; May, Joseph N.; and Thompson, David M., 3,856,460.
Thomson-CSF: *See—*
Billottet, Henri; Fechner, Patrice; Denoux, Robert; and Georgel, Jean, 3,855,899.
Favreau, Michel; and Vidal, Serge, 3,856,990.
Thordsen, Earl C.: *See—*
Henley, James M.; and Thordsen, Earl C., 3,855,947.
Thorn Electrical Industries Limited: *See—*
Major, Peter Colin; and Ogden, Kenneth Whittier, 3,857,063.
Thorwaldsen, Stanley E.: *See—*
Seifert, Lester H.; Powers, Raymond P.; Schmidt, William M.; Thorwaldsen, Stanley E.; Smith, Frederick W.; McElroy, David C.; and Dunton, Roy P., 3,855,763.
Throckmorton, Morford C.; and Saltman, William M., to Goodyear Tire & Rubber Company, The. Polymerization process. 3,856,764, Cl. 260-82.100.
Thumma, Francis L. Portable wheel stand. 3,856,264, Cl. 254-88.000.
Thurston, Elvin Frederick William; and Scott, John Gabriel Valentine, to Ilford Limited. Photographic silver halide emulsion containing a supersensitising combination. 3,856,532, Cl. 96-124.000.
Tierney, David P. Golf putting apparatus with ball return. 3,856,313, Cl. 273-176.0fb.
Tieszen, Dale O.; and Edmonds, James T., Jr., to Phillips Petroleum Company. Incorporation of high molecular weight fluorocarbon polymer in arylene sulfide polymer. 3,856,736, Cl. 260-29.60f.
Timmerman, Daniel Maurice: *See—*
Van Paesschen, August Jean; Herbots, Joseph Antoine; and Timmerman, Daniel Maurice, 3,856,530.
Tinman, Hugh J. Electrically-operable game apparatus. 3,856,307, Cl. 273-134.00a.
Tiramani, Marco, to Gloucester Engineering Co., Inc. Screen assembly for processing plastic. 3,856,277, Cl. 259-185.000.
Tisdale, Benjamin Cornwall, III; and Nicholson, William Buford. Apparatus for laying pipelines. 3,855,835, Cl. 72-183.000.
Todo, Naoyuki: *See—*
Kodera, Yoshihide; Todo, Naoyuki; and Fukuda, Kenzo, 3,856,925.
Tokai, Yoshiaki: *See—*
Sakai, Kouichi; Tokai, Yoshiaki; and Matsunaka, Sadayoshi, 3,856,884.
Tokyo Denryoku Kabushiki Kaisha: *See—*
Nikaido, Teruji; Haga, Kaoru; Sugiyama, Norio; and Fujiwara, Yasutaka, 3,857,071.
Tokyo Electronic Industry Co., Ltd.: *See—*
Yokoi, Hiromu; Ito, Kenichi; and Mizobuchi, Kenji, 3,856,985.
Tokyo Printing Ink Mfg. Co., Ltd.: *See—*
Kolshi, Hitoshi; Takao, Michio; Oda, Yasuhiro; Iguchi, Hideo; and Kohase, Shigeru, 3,856,759.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Sakurai, Masayuki; Takahashi, Syozo; and Kikuno, Hideo, 3,856,132.
Yokoi, Hiromu; Ito, Kenichi; and Mizobuchi, Kenji, 3,856,985.
Tollefson, James T. Spinning toy. 3,855,725, Cl. 46-1.00c.
Tomabechi, Ken, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Methods of and apparatus for detecting a failed fuel assembly. 3,856,620, Cl. 176-19.000.
Tomii, Kaoru; and Miyama, Hiroshi, to Matsushita Electric Industrial Company, Limited. Color camera tube having color strip filter and an index electrode. 3,857,037, Cl. 313-371.000.
Tomimoto, Naokazu: *See—*
Saito, Nagao; Kobayashi, Kazuhiko; and Tomimoto, Naokazu, 3,857,011.
Tompkins, Edwin H.: *See—*
Kinney, Layton C.; and Tompkins, Edwin H., 3,855,928.
Tomy Kogyo Co., Ltd.: *See—*
Matsumoto, Takao; and Aoki, Masaru, 3,856,304.
Tool & Instruments Associates, Inc.: *See—*
Brown, Hart; and Puckett, Howard N., 3,856,046.
Torian, John T.; and Safford, Richard W., to Fairchild Hiller Corporation. Guidance system. 3,856,237, Cl. 244-3.110.
Tornoe, John A.; and Dyer, Curtis A., to Schlage Lock Company. Reseasable knob for a lock. 3,856,339, Cl. 292-336.300.
Torvund, Bjarne. Tippable containers. 3,856,164, Cl. 214-315.000.
Towner Manufacturing Company: *See—*
Helbing, Clarence R.; Peters, Russel; and Cooper, Hugh E., 3,855,764.
Toyo Bearing Manufacturing Company Limited: *See—*
Tateisi, Hiromiti; and Tamura, Mituo, 3,855,735.
Toyo Soda Manufacturing Co., Ltd.: *See—*
Iijima, Akira; Yokoyama, Yujiro; Yamada, Yosuke; and Kimura, Makoto, 3,856,448.
Tracey, Donald John, Jr.: *See—*
Vitalis, Emil Alfred; and Tracey, Donald John, Jr., 3,856,722.
Tracker, Martin, Corporation: *See—*
Swift, Gilbert; Moore, William M.; and Milberger, Lionel J., 3,856,410.
Traenckner, Hans-Joachim; Rudolph, Hans; Rosenkranz, Hans Jurgen; Fuhr, Karl; and Patheiger, Manfred, to Bayer Aktiengesellschaft. Highly reactive unsaturated polyester resin compositions which contain acrylamide-methylol-ethers and can be cured by UV-ligh. 3,856,644, Cl. 204-159.150.
Trajbar, Branko. Refuse compactor. 3,855,918, Cl. 100-49.000.
Traylor, Donald R. Tactile drawing and writing device. 3,855,707, Cl. 33-24.00c.

Trefry, William A. Retention clip for ball and socket joint. 3,856,422, Cl. 403-122.000.

Triggs, Henry Francis, to Remalo Engineering Company Limited. Machine for pushing pegs out of a game board. 3,856,311, Cl. 273-139.000.

Tropicana Products, Inc.: *See—*
Rossi, Anthony T., 3,856,171.

Trouilhet, Maurice Marie Achille, to SEB S.A. Small-sized linen ironing machine. 3,855,717, Cl. 38-60.000.

Truman, Norman Nathan: *See—*
Cuttell, Willis Robert; and Truman, Norman Nathan, 3,856,557.

TRW Inc.: *See—*
Dardick, David, 3,855,931.
Porter, Wallace M., Jr., 3,855,736.

Tsuchiya, Hideshi; Takematsu, Tetsuo; Hasegawa, Yoichi; and Furushima, Masakazu, to Mitsubishi Gas Chemical Company, Inc. Plant growth regulating composition. 3,856,850, Cl. 260-501.130.

Tsuda, Yoshiaki: *See—*
Arimura, Katsuo; Kobayakawa, Toshihiro; Ao, Hideki; and Tsuda, Yoshiaki, 3,856,797.

Tucich, Paul J. File drawers lock. 3,856,373, Cl. 312-216.000.

Tucker, Carl L., to Singer Company, The. Side expansion scroll-type blowers. 3,856,431, Cl. 415-219.000.

Tudor Games, Incorporated: *See—*
Payne, Calvin L., Jr.; Gambello, Vincent J.; and Molnar, John A., 3,856,303.

Tully, Frank R.: *See—*
Christie, Christopher E.; Appleby, Paul E.; and Tully, Frank R., 3,856,070.

Turner, Robert A., to Sobel, Jack. Astringent gel, its preparation and use. 3,856,941, Cl. 424-145.000.

Turner, Robert L.: *See—*
English, Myrle H.; Goodstal, Laurence; Leek, Wayne E.; Sanzo, Robert J.; Turner, Robert L.; Workman, Clark B.; and Yetter, Edward W., 3,857,025.

TVI Marketing, Inc.: *See—*
Neumann, James W.; and Yielding, Douglas L. (said Neumann assor. to), 3,856,901.

Twyford Moors (Aircraft & Engineering) Limited: *See—*
Doe, Ewart H.; and Linforth, William J., 3,856,197.

Tyler, Hugh Jean: *See—*
Mitts, Richard K.; and Tyler, Hugh Jean, 3,856,057.

Tympanium Corporation: *See—*
Van Opijnen, L. J., 3,857,082.

Tyson, David L.: *See—*
Nieder, Berthold L.; and Tyson, David L., 3,855,685.

UBE Industries, Ltd.: *See—*
Suzukawa, Yuichi; Kono, Hisashi; and Kuribayashi, Atushi, 3,856,441.

Uchida, Haruo: *See—*
Shirai, Shogo; and Uchida, Haruo, 3,857,055.

Uchida, Kosaku; Ide, Susumu; Kanamaru, Toshiji; and Kitamura, Sadafumi, to Matsushita Electric Industrial Co., Ltd. Channel indicating for television receivers. 3,855,962, Cl. 116-124.100.

Uchida, Kosaku; Ide, Susumu; Kanamaru, Toshiji; and Kitamura, Sadafumi, to Matsushita Electric Industrial Co., Ltd. Channel indicating device for television receivers. 3,855,964, Cl. 116-124.400.

Uchida, Yasuo, to Ishikawa Tekko Kabushiki Kaisha. Ball joint. 3,856,423, Cl. 403-140.000.

Ueshima, Takashi; Kobayashi, Shoichi; and Matsuoka, Masami, to Showa Denko K.K. Polymers of cyano-substituted norbornene derivatives and method for preparing the same. 3,856,758, Cl. 260-78.40n.

Ullman, Edwin F.: *See—*
Schneider, Richard S.; and Ullman, Edwin F., 3,856,469.

Ulrich, Henri; Stuber, Fred A.; and Broggi, Allen J., to Upjohn Company, The. Process for preparing lithographic plates. 3,856,523, Cl. 96-33.000.

Umbaugh, Charles Wayne, to Honeywell Information Systems, Inc. Method for assembling microelectronic apparatus. 3,855,693, Cl. 29-626.000.

Umeno, Masashi: *See—*
Shimozato, Joji; Umeno, Masashi; and Yabuta, Shiro, 3,856,729.

Umezawa, Hamao; Okami, Yoshiro; Takeuchi, Tomio; and Ishiyama, Tetsuji, to Zaidan Hojin Biseibutsu Kagaku Kenkyukai (Microbial Chemistry Research Foundation). Kosugamycin as a plant disease preventive agent. 3,856,969, Cl. 424-283.000.

Underground Mining Machinery Limited: *See—*
Gibson, John; and Nelson, James, 3,855,871.

Underground Products, Inc.: *See—*
Sinko, George M., 3,856,246.

Union Carbide Corporation: *See—*
Brindley, Robert E., 3,856,137.
Fan, You Ling; and Greggshaw, Richard, 3,856,606.
Papa, Anthony Joseph; Proops, William Robert; and Shields, Theodore Curtis, 3,856,865.

Union Oil Company of California: *See—*
Keller, Theodore E., 3,856,468.
McArthur, Dennis P., 3,856,702.
McArthur, Dennis P., 3,856,705.

Uniroyal, Inc.: *See—*
Guillot, David G., 3,856,835.

Uniroyal Ltd.: *See—*
Strong, Clifford H. G., 3,856,569.

United Merchants and Manufacturers, Inc.: *See—*
Gregorian, Razmic S.; and Hoernle, Hans R., 3,856,598.

United States of America
Agriculture: *See—*
Kenney, Harold E.; and Donahue, Edward T., 3,856,688.
Lambou, Madeline G.; and Spadaro, James J., 3,856,700.
Moulton, Karl J.; and Beal, Robert E., 3,856,710.

Air Force: *See—*
Lordan, Jack M., 3,855,849.
Snyder, Ronald R., 3,855,686.

Army: *See—*
Campagnuolo, Carl J.; and Curto, Paul A., 3,856,432.
Harris, Fred T.; and Resler, Edwin L., Jr., 3,857,050.
Lazarus, Martin, 3,856,405.
Lohrmann, Dieter R., 3,857,099.
Messineo, Joseph R., 3,855,933.
Miller, Louis D., 3,857,035.
Nett, Rudolph E., 3,855,934.

Atomic Energy Commission: *See—*
Pollock, Charles B.; Scott, James L.; and Leitnaker, James M., 3,856,622.
Steinberg, Meyer; Colombo, Peter; and Farber, Gerald, 3,856,054.

Atomic Energy Commission, mesne: *See—*
Bates, John F.; Holmes, James J.; Paxton, Michael M.; and Straalsund, Jerry L., 3,856,517.
Smith, Jay E., 3,857,070.

Health, Education and Welfare: *See—*
Ito, Yoichiro; and Bosman, Robert L., 3,856,669.
Mead, John A. R., 3,856,959.
Zanboorie, Mohammed H., 3,857,067.

Health, Education, and Welfare, mesne: *See—*
Noble, Jack E.; Riggle, Peter; Emigh, Stuart G.; and Martini, William R., 3,855,795.

National Aeronautics and Space Administration: *See—*
Sinclair, Archibald R.; Burcher, Ernest E.; and Katzberg, Stephen J., 3,857,031.

National Aeronautics and Space Administration; Administrator; with respect to an invention of:
Dahm, Werner K.; Delgrego, Donald J.; Goldstein, Irving; Huffaker, Robert M.; Jelalian, Albert V.; Keene, Wayne H.; Miles, Perry A.; and Sonnenschein, Charles M. Clear air turbulence detector. 3,856,402, Cl. 356-28.000.
Koch, Edgar F. Combined pressure regulator and shutoff valve. 3,856,042, Cl. 137-505.420.
Morrison, Harry D.; and Carmin, Dorrie L., Jr. Anti-fog composition. 3,856,534, Cl. 106-13.000.
Summers, Robert H.; and Kenney, Ralph L. Geneva mechanism. 3,855,873, Cl. 74-436.000.

Navy: *See—*
Bens, Everett M.; and Holt, Lloyd J., 3,856,550.
Burns, William K.; and Andrews, Ronald A., 3,856,379.
Eversole, William C., 3,856,428.
Funk, Clarence J., 3,856,988.
Krishnan, Kamala S., 3,856,380.
Lagrange, Don E.; Davis, Edward J.; Scheer, Eugene R.; Brewer, Ralph E.; and Hamilton, Curtis A., 3,857,042.
Parker, Leland L.; Jones, Jerry O.; and Osburn, Michael R., 3,855,932.
Pilloff, Herschel S., 3,857,109.
Platzek, Harold M., 3,855,789.
Stayton, Leroy M.; and Herling, Theodore L., 3,856,219.

Scientific Research and Development: *See—*
Kincaid, John F.; Hammett, Louis P.; and Dailey, Benjamin P., 3,856,590.

United States Steel Corporation: *See—*
Adams, Richard C.; Kachik, Robert H.; Pignocco, Arthur J.; and Rall, Waldo, 3,856,076.

United States T.R.A.D. Corporation: *See—*
Younger, Reat R., 3,856,388.

Unites States of America, Army: *See—*
Steele, Wallace Lee Roy, 3,856,289.
National Aeronautics and Space Administration; Administrator; with respect to an invention of:
Petersen, Howard L.; and Kinell, Donald K. Four-phase logic system. 3,857,045, Cl. 307-208.000.

Universal Oil Products Company: *See—*
Greenwood, Arthur R., 3,856,662.
Hayes, John C., 3,856,870.
Schmerling, Louis, 3,856,888.
Vesely, Kenneth Donald, 3,856,912.

Universite de sherbrooke: *See—*
Deschenes, Pierre A.; Stephenne, Hubert; and Villeret, Michel, 3,857,111.
Picker, Patrick, 3,856,467.

University of Tennessee Research Corporation, The: *See—*
Kraus, Alfred P.; Kraus, Lorraine M.; and Wood, John L., 3,856,624.

Upjohn Company, The: *See—*
Birkenmeyer, Robert D., 3,856,943.
Chung, Tae H.; Dillon, Michael L.; and Lines, Gregory L., 3,856,862.
Graham, Boyd E.; and Skaletzky, Louis L., 3,856,965.
Hanka, Ladislav J.; and Martin, David G., 3,856,807.
Hester, Jackson B., Jr., 3,856,792.
Hester, Jackson B., Jr., 3,856,809.

Szmuszkovicz, Jacob, 3,856,802.
Ulrich, Henri; Stuber, Fred A.; and Broggi, Allen J., 3,856,523.
U.S. Philips Corporation: *See—*
Baars, Nicolaas Joris, 3,857,100.
Barten, Piet Gerard Joseph, 3,857,057.
Boudault, Robert; and Guion, Christian, 3,857,061.
Chermin, Hubertus Mathias Jozef, 3,857,060.
Jan Verstegen, Judicus Marinus Pieter; and De Meester, Emiel Petrus Juliaan, 3,856,697.
Meyer, Gerald; and Buzzi, Leo, 3,855,697.
Strik, Francis Bernardus; and Van Soerland, Nicolaas Augustinus Joseph, 3,856,518.
van der Donk, Johannes Martinus Augustines Henricus, 3,857,008.
Van der Heijde, Martin Clemens, 3,855,694.
Van der Meer, Johannes Anne, 3,855,739.
U.S. Reduction Co.: *See—*
Lindberg, Richard S.; and Armstrong, G. Leslie, 3,856,360.
Ushikoshi, Kenichi, to Kabushiki Kaisha Suwa Seikosha. Calendar correcting device for timepiece. 3,855,785, Cl. 58-58.000.
Ushiyama, Yoshito: *See—*
Chihara, Hiroyuki; and Ushiyama, Yoshito, 3,855,781.
Uskokovic, Milan Radoje: *See—*
Narwid, Thomas Albert; and Uskokovic, Milan Radoje, 3,856,780.
USM Corporation: *See—*
Andriola, Achilles D.; Kuehn, Howard E.; Whittum, Warren C.; and Wink, Donald E., 3,855,681.
Lutts, Carlton G.; and Stewart, James R., 3,856,294.
Meyer, Engelbert A., 3,855,669.
Usui, Keizaburo; Abe, Eiichi; and Hayama, Isao, to Nissan Motor Company, Limited. Synchronizing device for manually operated power transmission mechanism. 3,856,121, Cl. 192-53.00f.
Valdelievre, Etienne, to Inter Textiles European. Process for producing ply yarn from threads of fibers. 3,855,775, Cl. 57-140.0by.
Valdo, Alex R.: *See—*
Sanders, Robert N.; and Valdo, Alex R., 3,856,583.
Valek, Robert J., to Motorola, Inc. Magnetic sensor device for ignition systems. 3,855,983, Cl. 123-146.50a.
Van den Boogaart, Krijn; and Louis, Meelis Nicolaus, to Pennwalt Corporation. Method for manufacturing a stabilized manganese ethylenebisdithiocarbamate product and method for manufacturing fungicidal preparations containing such stabilized product. 3,856,36, Cl. 260-429.00k.
Van der Aa, Hendrik; and Van der Aa, Johan, to Movatex Products Ltd., mesne. Sewing apparatus. 3,856,224, Cl. 242-55.000.
Van der Aa, Johan: *See—*
Van der Aa, Hendrik; and Van der Aa, Johan, 3,856,224.
van der Donk, Johannes Martinus Augustines Henricus, to U.S. Philips Corporation. Alternate make-brake type slide switch with improved movable contact. 3,857,008, Cl. 200-153.00j.
Van der Heijde, Martin Clemens, to U.S. Philips Corporation. Method of winding deflection coils for picture display tubes. 3,855,694, Cl. 29-605.000.
Van der Meer, Johannes Anne, to U.S. Philips Corporation. Device for grinding curved surfaces. 3,855,739, Cl. 51-234.000.
Van Englehoven, Clarence, to King Radio Corporation. Optical course datum heading selection transducer. 3,857,032, Cl. 250-231.00r.
Van Opijnen, L. J., to Tympanium Corporation. Electronic voltage regulator for battery charging. 3,857,082, Cl. 320-25.000.
Van Paesschen, August Jean; Herbots, Joseph Antoine; and Timmerman, Daniel Maurice, to Agfa-Gevaert N.V. Photographic polyester film material comprising antistatic layer. 3,856,530, Cl. 96-87.00a.
Van Soerland, Nicolaas Augustinus Joseph: *See—*
Strik, Francis Bernardus; and Van Soerland, Nicolaas Augustinus Joseph, 3,856,518.
Van Vliet, Edward, to Fluid Energy Processing & Equipment Company. Encrustation-preventing device for fluid energy type mills. 3,856,215, Cl. 241-39.000.
Varadibriarwood, Andrew G.; Rubinstein, Richard B.; and Radoff, Steven, to General Instrument Corporation. Shift register-recorder circuit for addressing permanent storage memory. 3,857,046, Cl. 307-221.00r.
Varian Associates: *See—*
Moon, Ronald L.; Stein, William W.; and Warnock, Donald, 3,856,585.
Vartanian, Perry H., Jr.: *See—*
Hedman, Clarence L., Jr.; Myrenne, Karl-Dieter S.; and Vartanian, Perry H., Jr., 3,856,381.
Vater, Wulf: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,856,798.
Verderber, Jerome. Combination fuel line and ignition lock for motor vehicles. 3,855,828, Cl. 70-243.000.
Vereinigte Osterreichische Eisen- und Stahlwerke Alpine Montan Aktiengesellschaft: *See—*
Filter, Walther, 3,856,056.
Hoyer, Otto, 3,856,284.
Verheijen, Egidius J. M.: *See—*
Deumens, Johannes J. M.; Verheijen, Egidius J. M.; and Thoma, Jozef A., 3,856,819.
Vernaleken, Hugo: *See—*
Margotte, Dieter; Vernaleken, Hugo; and Schnell, Hermann, 3,856,886.
Vesely, Kenneth Donald, to Universal Oil Products Company. Recovery of platinum from deactivated catalysts. 3,856,912, Cl. 423-22.000.
Vesely, Miloslav; and Bohac, Zdenek, to Vyzkumny ustav organickych syntez. Apparatus for cleaning a mercury-dropping electrode of a through-flow polarographic analyzer. 3,857,088, Cl. 324-31.000.
Vessalo, William V., to Mine Safety Appliances Company. Inhalant package. 3,856,142, Cl. 206-530.000.
Vetter, Curtis E. Tethered ball apparatus adapted for play under weightless conditions. 3,856,305, Cl. 273-95.00a.
Vick, James A.; and Castner, Charles S., to Schyler Development Corporation. Composition and method for cortisol control. 3,856,936, Cl. 424-98.000.
Vickers Limited: *See—*
Mitchie, Robert Edward; and Price, Peter Michael Myatt, 3,857,095.
Victor Comptometer Corporation: *See—*
Joyce, Ronald W.; and Dozier, Ross T., 3,855,990.
Vidal, Serge: *See—*
Favreau, Michel; and Vidal, Serge, 3,856,990.
Viking Industries, Inc.: *See—*
Byerly, Robert M., 3,856,245.
Villeret, Michel: *See—*
Deschenes, Pierre A.; Stephenne, Hubert; and Villeret, Michel, 3,857,111.
Vinyl Products Limited, mesne: *See—*
Sturt, Alan Charles; and Williams, Richard Harvey, 3,856,733.
Vital, Zoltan; and Orban, Jean, to Ponder & Best, Inc. Automatic control of light flash pulses. 3,857,064, Cl. 315-241.00p.
Vitalis, Emil Alfred; and Tracey, Donald John, Jr., to American Cyanamid Company. Novel alkali metal salts of higher aliphatic fatty acid ethanolamide sulfosuccinate as foaming agents for latices and compositions containing the same. 3,856,722, Cl. 260-2.5l.
Vogel, Ralph A.: *See—*
Arick, Robert E.; and Vogel, Ralph A., 3,856,221.
Vogt, Wilhelm; Fischer, Edgar; and Auer, Eberhard, to Hoechst Aktiengesellschaft, mesne. Oligomers and/or polymers containing carboxylic and hydroxylic groups, and process for making them. 3,856,755, Cl. 260-78.50t.
Vokral, Edward J., to EVO Corporation. Holder for annular filter. 3,856,489, Cl. 55-379.000.
Voltmer, Helmut: *See—*
Faltot, Maurice J.; and Voltmer, Helmut, 3,856,607.
von der Lieth, William H.: *See—*
Harmon, James F.; Johnston, Richard D.; Lach, John H.; von der Lieth, William H.; and Murphy, Thomas L., 3,855,913.
Von Roll AG. Werk Bern: *See—*
Feuz, Fritz, 3,856,118.
Vowles, Colin: *See—*
Sapkus, Jurgis; Lewis, J. Stephen; Vowles, Colin; and Yarbrough, William R., 3,855,729.
Vrisakis, George; and Machurat, Jean. Elastomers reinforced with siliceous fillers. 3,856,723, Cl. 260-4.000.
Vukotic, Milos: *See—*
Eriksson, Bolik Anders; and Vukotic, Milos, 3,855,666.
Vyzkumny a vyvojovy ustav Zavody vseobecneho strojirenstvi: *See—*
Sterba, Josef, 3,855,821.
Vyzkumny ustav organickych syntez: *See—*
Vesely, Miloslav; and Bohac, Zdenek, 3,857,088.
Wachtel, Anselm: *See—*
Lehmann, Willi; and Wachtel, Anselm, 3,857,054.
Wagner, Kuno; Oertel, Gunter; Golitz, Hans Dietrich; deceased (by Golitz, Ingrid Irene Klarchen; heiress); and Quiring, Bernd, to Bayer Aktiengesellschaft. Silyl substituted urea derivatives and a process for their preparation. 3,856,756, Cl. 260-77.5aq.
Wagner, Richard C., to Hollymatic Corporation, mesne. Refrigerating apparatus. 3,855,815, Cl. 62-266.000.
Wagner, Willem M.: *See—*
Hunter, Susan E.; Boyce, Clive B. C.; Armitage, Brian P.; Haken, Pieter Ten; and Wagner, Willem M., 3,856,976.
Wahl Clipper Corporation: *See—*
Meyer, Roy E.; and Wahl, John F., 3,857,016.
Wahl, John F.: *See—*
Meyer, Roy E.; and Wahl, John F., 3,857,016.
Wahlert, Stanely D., to Procter & Gamble Company, The. Method of segregating articles being conveyed. 3,856,665, Cl. 209-73.000.
Waite, Herbert: *See—*
Nodine, John H.; Waite, John Herbert; Waite, Herbert; and Fletcher, Martin J., 3,856,930.
Waite, Jack Peter, to American Cyanamid Company. Process for isolation of antibiotic AV290. 3,856,937, Cl. 424-115.000.
Waite, John Herbert: *See—*
Nodine, John H.; Waite, John Herbert; Waite, Herbert; and Fletcher, Martin J., 3,856,930.
Wake, John A.; and St. Andre, Arthur F., to Cincinnati Milacron-Heald Corporation. Machine tool utilizing a potentiometer for determining various positions. 3,857,079, Cl. 318-663.000.
Walker, Darrell W.: *See—*
Bertus, Brent J.; and Walker, Darrell W., 3,856,879.
Walker, David John; and Branlard, Paul, said Walker, David John, assor. to BP Chemicals International Limited and said Branlard, Paul, assor. to Distugil S.A. Polymer. 3,856,730, Cl. 260-27.00r.
Wallace, Earl C.: *See—*

Bell, Richard A.; Wallace, Earl C.; and Winters, Ted W., 3,856,347.

Wallace, Robert S. Magnetic tape control arm. 3,856,235, Cl. 242-199.000.

Waller, Bruce E. Acupuncture needle. 3,856,019, Cl. 128-329.000.

Walles, Wilhelm E., to Dow Chemical Company, The. Vacuumized plastic cap for heat insulating containers. 3,856,172, Cl. 215-364.000.

Walter, Frederick L.; and Holt, Ronald, to Battle-Creek Packaging Machinery; Div. of Franklin Electric Subsidiaries, Inc. Fixed longitudinal side folder. 3,855,758, Cl. 53-226.000.

Ward, Harold R.: *See*—
Bojas, Edward J.; and Ward, Harold R., 3,855,792.

Warner-Lambert Company: *See*—
Zinnes, Harold; Sircar, Jagadish C.; and Shavel, John, Jr., 3,856,784.

Warnock, Donald: *See*—
Moon, Ronald L.; Stein, William W.; and Warnock, Donald, 3,856,585.

Wartes, Lloyd L. Method for loading and transporting coal. 3,856,087, Cl. 169-45.000.

Waschulewski, Hans-Georg; Baumers, Hans; and Gerresheim, Dusseldorf, to Losenhausen Maschinenbau AG. Ramming or tamping machine or the like. 3,856,426, Cl. 404-133.000.

Washington University: *See*—
Margraf, Harry W., 3,856,805.

Wasteland Reclamation Corporation: *See*—
Grable, Donovan B., 3,856,355.

Wasteland Reclamation Corporation, mesne: *See*—
Grable, Donovan B., 3,855,807.

Watanabe, Isao: *See*—
Yamaguchi, Tadashi; Ono, Takayuki; Hoshi, Hiroshi; Hirakawa, Michio; and Watanabe, Isao, 3,856,745.

Watanabe, Masanori: *See*—
Ogihara, Masuo; and Watanabe, Masanori, 3,856,393.

Watanabe, Toshiyuki: *See*—
Asada, Chiaki; and Watanabe, Toshiyuki, 3,856,514.

Waters, Barrett Bradford, to Hobart Corporation. Blades for food preparing machine. 3,856,220, Cl. 241-282.100.

Watson, Billy Ray. Packer device having a J-latch and seal means. 3,856,080, Cl. 166-120.000.

Weber, Heinz, to Telesco Brophey Limited. Telescopic umbrella. 3,856,031, Cl. 135-25.000.

Webline Corporation, The: *See*—
Blitch, William E., 3,855,642.

Wechter, Margaret A.: *See*—
Hahn, Paul B.; Johnson, Dennis C.; Shanks, Howard R.; and Wechter, Margaret A., 3,856,634.

Weetman, David G.: *See*—
Haugen, Haakon; and Weetman, David G., 3,856,691.

Wehnelt, Ulrich: *See*—
Heywang, Hermann; Kobale, Manfred; Preissinger, Karl-Heinz; Ristow, Dietrich; and Wehnelt, Ulrich, 3,857,074.

Weimer, Paul Kessler, to RCA Corporation. Sensors having charge transfer recycling means. 3,856,989, Cl. 178-7.100.

Weisbord, Leon; and Krupick, Walter J., to Singer Company, The. Gyroscope universal flexure suspension assembly. 3,856,366, Cl. 308-2.00a.

Weiss, Gerald L., to NL Industries, Inc. Non-toxic compositions for use in primer coating formulations. 3,856,546, Cl. 106-300.000.

Weisz, Paul B.; Chen, Nai Yuen; and Lucki, Stanley J., to Mobil Oil Corporation. Fuel systems for engines. 3,855,980, Cl. 123-3.000.

Weitzman, Milton J.: *See*—
Poliak, John M.; Weitzman, Milton J.; and Lopez, Juan M., 3,856,376.

Weller, Peter A., to McCord Corporation. Compressible energy absorbing article. 3,856,613, Cl. 161-116.000.

Wellman, Donald Edward, to General Crane Industries Limited. Mobile load handling means, particularly tower cranes. 3,856,150, Cl. 212-46.00a.

Wells, Frank M.; and Black, Gordon J., to Ameron, Inc. Facing ring and pouring chute for vertically cast concrete pipe. 3,856,453, Cl. 425-447.000.

Wenstrom, Richard T., to Sea Savory, Inc. Apparatus for separating edible crab meat from non-edible portions of cooked crabs. 3,855,668, Cl. 17-71.000.

Werner & Pfleiderer: *See*—
Eisenmann, Gerhard, 3,856,278.

West, Charles M.; Graham, Glen H.; and Kennedy, James S., to Dow Chemical Company, The. Inherently flexible, high strength sheeting from blends of a suspension chlorinated olefin polymer and post-chlorinated polyvinyl. 3,856,891, Cl. 260-897.00c.

West, James I., Jr. Incinerating commode. 3,855,645, Cl. 4-131.000.

Western Electric Company, Incorporated: *See*—
Francis, Ajax C., Jr., 3,855,895.
George, Carroll H., 3,856,654.
Niesse, Paul Joseph, 3,857,013.

Western Roto Thresh Ltd.: *See*—
Habicht, Bernard G., 3,856,023.

Westinghouse Electric Corporation: *See*—
Boundy, Bruce K., 3,856,981.
Brandt, Gerlad B.; and Gottlieb, Milton, 3,856,378.
Braunstein, Harry R., 3,857,068.
Carlson, Norman R.; and Zitelli, William E., 3,857,027.
Hoffmann, Joseph H., 3,856,434.
Kim, He B.; and Driver, Michael C., 3,855,690.
Lay, Robert; and Haller, Clayton L., 3,857,002.
Lehmann, Willi; and Wachtel, Anselm, 3,857,054.
Leschek, Walter C., 3,855,847.
Savage, Conwell, 3,856,116.
Sletten, Andreas M.; and Cookson, Alan H., 3,856,978.
Solymos, Frederick, 3,856,117.

Westling, Randolph E., to Gulf Oil Corporation. Underwater oil storage tank and method of submerging same. 3,855,809, Cl. 61-46.500.

Westvaco Corporation: *See*—
Dowd, Daniel J., Jr., 3,856,226.

Wetstone, Janet M. Molded picture frame. 3,856,257, Cl. 249-160.000.

Wharton, George C. Combination rotor-box cutter mining machine and method of mining. 3,856,357, Cl. 299-12.000.

Wheaton Industries: *See*—
Panas, Walter, 3,855,966.

Wheaton, Robert Bradford: *See*—
Boswinkle, George; and Wheaton, Robert Bradford, 3,856,672.

Whelan, Edward J.: *See*—
Skrypek, John P.; and Whelan, Edward J., 3,855,967.

Whirlpool Corporation: *See*—
Boswinkle, George; and Wheaton, Robert Bradford, 3,856,672.
Drews, Reinhold Alvin; Rosinski, Alexander B., Jr.; and Gauer, Joseph August, 3,856,036.
Hetland, Thomas Erwin, 3,857,076.
Linstromberg, William J., 3,855,812.

White, James T.; and Gumprecht, Donald L., to Reichhold Chemicals, Inc. Methods for treating fibreboard with aminoplast copolymer blends. 3,856,562, Cl. 117-140.00a.

Whitehead, Alvin C.: *See*—
Whitehead, Richard K., Sr.; Whitehead, Richard K., Jr.; and Whitehead, Alvin C., 3,856,231.

Whitehead, Richard K., Jr.: *See*—
Whitehead, Richard K., Sr.; Whitehead, Richard K., Jr.; and Whitehead, Alvin C., 3,856,231.

Whitehead, Richard K., Sr.; Whitehead, Richard K., Jr.; and Whitehead, Alvin C. Bobbin holder. 3,856,231, Cl. 242-130.200.

Whitehurst, Darrell Duayne, to Mobil Oil Corporation. Sorbent for heavy metals. 3,856,664, Cl. 208-253.000.

Whittier, Carl H., to Dynarad, Inc. Unitary thermal reference source. 3,857,017, Cl. 219-501.000.

Whittum, Warren C.: *See*—
Andriola, Achilles D.; Kuehn, Howard E.; Whittum, Warren C.; and Wink, Donald E., 3,855,681.

Wiedermann, Hans E.: *See*—
Kuhla, Donald E.; Sarges, Reinhard; and Wiedermann, Hans E., 3,856,806.

Wieseckel, David A.: *See*—
Bartlo, John S.; Safranski, Richard W.; Hart, Charles G.; and Wieseckel, David A., 3,856,097.

Wiessner, Willi: *See*—
Schmidt, Ewald; and Wiessner, Willi, 3,856,416.

Wiggins Teape Research & Development Limited: *See*—
Jenkins, Frank Llewellyn, 3,856,551.

Wikman, Andrew O., to Ethyl Corporation. Chemical process. 3,856,844, Cl. 260-465.50a.

Wild, Daniel: *See*—
Closs, Felix H.; Mueller, Hans R.; and Wild, Daniel, 3,856,993.

Wildhaber, Ernest. Optical scanner with single optical head. 3,856,377, Cl. 350-6.000.

Wildhaber, Ernest. Rotor pair for positive fluid displacement. 3,856,440, Cl. 418-195.000.

Wilensky, Samuel; and Roberge, James K., to Hybrid Systems Corporation. Multiplying current mode digital-to-analog converter. 3,857,021, Cl. 235-150.520.

Wiley, Ron; and Searing, Harvey R., to Leo's Quality Foods. Slicer. 3,855,889, Cl. 83-329.000.

Willetts, Elwood H. Multiple axle vehicle suspension system. 3,856,325, Cl. 280-124.00r.

Williams, Edward B., Jr. Drill string and drill collar therefor. 3,856,096, Cl. 175-325.000.

Williams, Marvin E., to Scott, O. M., & Sons Company, The. Material spreader utilizing plug-in material container. 3,856,211, Cl. 239-685.000.

Williams, Richard Harvey: *See*—
Sturt, Alan Charles; and Williams, Richard Harvey, 3,856,733.

Wilson, John C., to Eastman Kodak Company. Diacid-xanthylium ion polyester and photographic element comprised thereof. 3,856,751, Cl. 260-47.00c.

Wilson, John Stuart; and Cutts, Ronald George. Apparatus for collection of sediment in bottled fluids. 3,856,169, Cl. 215-6.000.

Wilson, Lee, Engineering Company of Canada Ltd.: *See*—
Sanderson, Karl, 3,855,952.

Winitz, Milton; and Graff, Jack, to Granted to the United States National Aeronautics and Space Administration under the provision of 42 U.S.C. 2457. Amino acid analysis. 3,856,471, Cl. 23-253.00r.

Wink, Donald E.: *See*—
Andriola, Achilles D.; Kuehn, Howard E.; Whittum, Warren C.; and Wink, Donald E., 3,855,681.

Winnie, Alon P., to Johnson & Johnson. Catheter placement unit. 3,856,009, Cl. 128-214.400.

Winterbottom, Kenneth: *See*—

Dobinson, Bryan; and Winterbottom, Kenneth, 3,856,464.
Winters, Ted W.: *See—*
Bell, Richard A.; Wallace, Earl C.; and Winters, Ted W., 3,856,347.
Wirfelt, Sven Axel Olof, to Sandvik Aktiebolag (formerly k/a Sandvikens Jernverks Aktiebolag). Milling cutter. 3,855,680, Cl. 29-105.00a.
Wirtz, Edward A.: *See—*
Cryder, John R.; and Wirtz, Edward A., 3,856,041.
Wisbey, Philip Henry, to Marconi Company, Limited, The. Semiconductor device mounting arrangements. 3,857,115, Cl. 333-84.00m.
Wise, Albert W.: *See—*
Hamb, Fredrick L.; Hiller, Gary L.; and Wise, Albert W., 3,856,526.
Hamb, Fredrick L.; Hiller, Gary L.; and Wise, Albert W., 3,856,527.
Wiss, John W. Reflectively coated combustion chamber for internal combustion engines and method of using same. 3,855,986, Cl. 123-191.00a.
Witco Chemical Corporation: *See—*
Mausner, Marvin L.; and Dater, Arnold H., 3,856,711.
Wittmann, Raymond H., to Harvey, Sid, Manufacturing Co., Inc. Bleed wrench. 3,855,882, Cl. 81-121.00r.
Wohnhaas, Horst; Haas, Kurt; and Granzow, Manfred, to Dornier Systems GmbH. Spiral-grooved bearing and method of manufacture. 3,856,367, Cl. 308-9.000.
Woitsch, Werner, to Messerschmitt-Bolkow-Blohm GmbH. Magnetically supported suspended railway. 3,855,939, Cl. 104-148.0ms.
Wokas, Albert L. Building construction. 3,855,743, Cl. 52-79.000.
Wolff, Justus: *See—*
Simon, Stefan; Wolff, Justus; and Johst, Wolfgang, 3,856,143.
Wolff Walsrode Aktiengesellschaft: *See—*
Hoppe, Lutz; and Behn, Rudolf, 3,856,742.
Wolk, Ronald H.; and Chervenak, Michael C., to Hydrocarbon Research Inc. Slurried solids handling for coal hydrogenation. 3,856,658, Cl. 208-10.000.
Wood, John L.: *See—*
Kraus, Alfred P.; Kraus, Lorraine M.; and Wood, John L., 3,856,624.
Wood, Thomas F.; and Heilweil, Emanuel, to Givaudan Corporation. Process for 6-isopropyl-1,1,4-trimethylindan. 3,856,869, Cl. 260-668.00f.
Wood, Thomas F.; and Heilweil, Emanuel, to Givaudan Corporation. Process for producing 1,1,3,4,4,6-hexamethyl-1,2,3,4-tetrahydronapthalene(HMT). 3,856,875, Cl. 260-668.00f.
Woods, Jack L.: *See—*
Pittman, Tobe A.; and Woods, Jack L., 3,856,474.
Woodward, Ernest Ray: *See—*
Scott, James E., Jr.; and Woodward, Ernest Ray, 3,856,616.
Woollett, Edward Arthur: *See—*
Phillipps, Gordon Hanley; May, Peter John; McDonald, Brian; and Woollett, Edward Arthur, 3,856,828.
Work Wear Corporation: *See—*
Sislian, Robert J., 3,856,005.
Workman, Clark B.: *See—*
English, Myrle H.; Goodstal, Laurence; Leek, Wayne E.; Sanzo, Robert J.; Turner, Robert L.; Workman, Clark B.; and Yetter, Edward W., 3,857,025.
Woskow, Marvin Z.; and Christmann, Harold F., to Petro-Tex Chemical Corporation. Oxidative dehydrogenation catalyzed with promoted zinc ferrite. 3,856,880, Cl. 260-680.00e.
Wray, Gary Q.: *See—*
Holden, John C.; and Wray, Gary Q., 3,856,085.
Wray, Rhodes Ebeling, to Du Pont de Nemours, E. I., and Company. Absorbent yarn bobbin. 3,856,225, Cl. 242-118.320.
Wray, William R.; and Stella, Joseph A., to Polaroid Corporation. Sound editor for sound motion picture projector. 3,856,387, Cl. 352-5.000.
Wright, Charles A.: *See—*
Rohn, Ivan D.; Kleine, Richard A.; and Wright, Charles A., 3,856,639.
Wright, George C.; Burch, Homer A.; and Goldenberg, Marvin M., to Morton-Norwich Products, Inc. 3-Diethylamino-2,2-dimethylpropyl 5-(substituted phenyl)-2-furoates. 3,856,825, Cl. 260-347.500.
Wright, H. Dudley: *See—*
Halfar, Kurt; Hitchman, Michael L.; and Mehl, Wolfgang, 3,856,640.
Wright, James Robert: *See—*
Danilewicz, John Christopher; Kemp, John Edward Glyn; Snarey, Michael; and Wright, James Robert, 3,856,794.
Wright, James T., to Carlson-Dimond & Wright, Inc. Adjustable safety die block - radial lobe design. 3,855,920, Cl. 100-53.000.
Wright, James T., to Carlson-Dimond & Wright, Inc. Adjustable U-shape safety die block. 3,855,921, Cl. 100-53.000.
Wubbe, Leo J., to Anderson Company, The. Wiper blade refill element. 3,855,664, Cl. 15-250.420.
Wulf, Helmut: *See—*
Albrecht, Wilhelm; and Wulf, Helmut, 3,855,876.
Wurlitzer Company, The: *See—*
Thomas, Howard M.; and Olszowka, Robert F., 3,855,894.
Wurst, John W., to Singer Company, The. Sewing machine stitch pattern generation from stitch data stored in static memory. 3,855,956, Cl. 112-158.00e.
Wust, Olivier, to Rieter Machine Works Ltd. Method of automatically changing winding tubes and winding apparatus for implementing the aforesaid method and improved spool doffing mechanism. 3,856,222, Cl. 242-18.00a.
Xerox Corporation: *See—*
Honjo, Satoru; and Sato, Masamichi, 3,856,519.
Hynes, Frank R.; May, Joseph N.; and Thompson, David M., 3,856,460.
Jordan, William E., 3,856,461.
Kilkes, Robert J., 3,856,997.
Looney, John H., 3,856,295.
Lynch, Thomas; Berner, Douglas G.; and Hynes, Frank R., 3,855,890.
Mammino, Joseph; and Amidon, Alan B., 3,856,692.
Mueller, Karl J., 3,856,462.
Post, Donald Saxton, 3,856,125.
Taylor, Thomas W.; Ciuffini, Anthony J.; and Gerace, Paul L., 3,856,548.
Yabuta, Shiro: *See—*
Shimozato, Joji; Umeno, Masashi; and Yabuta, Shiro, 3,856,729.
Yagiela, Frank D.; and Crowell, Millard D., to General Motors Corporation. Surface finish measuring gauge. 3,855,843, Cl. 73-37.000.
Yagitani, Takayuki, to Shizuki Electrical Mfg. Co., Ltd. Capacitor with polypropylene dielectric. 3,857,073, Cl. 317-258.000.
Yale, Harry Louis; and Petigara, Ramesh B., to Squibb, E. R., & Sons, Inc. 2-Pyridylmethyl-3H,7H-quino(8,1-cd)(1,5) benzoxazepin-3-one compounds. 3,856,781, Cl. 260-240.00r.
Yale, Harry Louis; and Petigara, Ramesh B., to Squibb, E. R., & Sons, Inc. 2-Benzyl-3H,7H-quino(8,1-cd)(1,5) benzoxazepin-3-one compounds. 3,856,782, Cl. 260-240.00f.
Yale, Harry Louis; and Petigara, Ramesh B., to Squibb, E. R., & Sons, Inc. Certain 6,7-dihydro-pyrido[1,2-d][1,4,6]-benzodiazocines and 6,4-pyrido[1,2-c][1,3,5]-benzoxadiazepines 3,856,801, Cl. 260-296.00h.
Yamada, Akio. Shock absorbing apparatus. 3,856,285, Cl. 267-9.00c.
Yamada, Hisashi: *See—*
Susuki, Rinnosuke; Hoshi, Hiroshi; Saito, Jiro; Murakami, Keiichi; and Yamada, Hisashi, 3,856,746.
Yamada, Yasuo: *See—*
Yoshizawa, Toshio; Yamada, Yasuo; Taniguchi, Toshinori; Kose, Tatsuo; Ohchi, Kazuo; and Hori, Kiyokazu, 3,855,771.
Yamada, Yosuke: *See—*
Iijima, Akira; Yokoyama, Yujiro; Yamada, Yosuke; and Kimura, Makoto, 3,856,448.
Yamagami, Fumiyoshi: *See—*
Hayakawa, Masaya; Harada, Iki; and Yamagami, Fumiyoshi, 3,856,135.
Yamaguchi, Tadashi; Ono, Takayuki; Hoshi, Hiroshi; Hirakawa, Michio; and Watanabe, Isao, to Lion Yushi Kabushiki Kaisha and Lion Fat & Oil Co., Ltd. Process for the production of carbonaceous graft polymers. 3,856,745, Cl. 260-42.140.
Yamaha International Corporation: *See—*
Bowers, Michael R., 3,856,099.
Yamamoto, Eiji, to Kabushiki Kaisha Daini Seikosha. Impact-proof watchcase. 3,855,786, Cl. 58-88.00c.
Yamamoto, John R.: *See—*
Maughmer, Robert W.; and Yamamoto, John R., 3,856,403.
Yamamoto, Kiyoshi: *See—*
Yamashita, Gentaro; and Yamamoto, Kiyoshi, 3,856,855.
Yamamoto, Seijiro: *See—*
Sato, Wasuke; Yamamoto, Seijiro; Kuwabara, Nobuaki; and Adachi, Shigeru, 3,856,025.
Yamamoto, Takaaki: *See—*
Tanaka, Osamu; Yamamoto, Takaaki; and Takata, Toshihiko, 3,856,568.
Yamamoto, Tomio: *See—*
Yasue, Setsuo; and Yamamoto, Tomio, 3,856,167.
Yamamoto, Yoshiriro: *See—*
Nishio, Yasuhiro; Yamamoto, Yoshiriro; Okamoto, Zenichiro; Minami, Nagio; and Nagareda, Masazumi, 3,857,010.
Yamasaki, Akihiro: *See—*
Ishido, Yoshiharu; Yoshino, Teruo; Komura, Hajime; Suzuki, Katsumi; Yamasaki, Akihiro; and Okutsu, Masaru, 3,856,777.
Yamashita, Gentaro; and Yamamoto, Kiyoshi, to Teijin Limited. Process for preparation of naphthalene monocarboxylic acid or naphthalene dicarboxylic acid. 3,856,855, Cl. 260-524.00r.
Yamashita, Makoto; Ikura, Kenkichi; and Kushida, Masagoro, to Ichiko Industries Limited. Rear vision mirror apparatus for automobile. 3,856,383, Cl. 350-302.000.
Yamauchi, Akira, to Jex Co., Ltd. Sanitary napkin with porous resin powder deodorant. 3,856,014, Cl. 128-290.000.
Yamaura, Tokuharu; Takeda, Masayuki; Tajima, Koi; and Koike, Norio, to Showa Denko Kabushiki Kaisha. Process for preparing carbon paste. 3,856,926, Cl. 423-448.000.
Yamazaki, Shumpei; Kagawa, Ichiro; and Sugimura, Yuriko. Method of fabricating semiconductor memory device gate. 3,856,587, Cl. 148-187.000.
Yarbrough, William R.: *See—*
Sapkus, Jurgis; Lewis, J. Stephen; Vowles, Colin; and Yarbrough, William R., 3,855,729.
Yardley, John P., to American Home Products Corporation. Process for preparation of secondary amines from tertiary amines. 3,856,795, Cl. 260-283.0sy.
Yashima, Saburo: *See—*

Yashima, Saburo; Manabe, Haruo; Ito, Takuma; and Namikawa, Keishi, 3,856,666.

Yashima, Saburo; Manabe, Haruo; Ito, Takuma; and Namikawa, Keishi, to Yashima, Saburo and Nippon Mining Co., Ltd., mesne. Magnetic separator. 3,856,666, Cl. 209-219.000.

Yasue, Setsuo; and Yamamoto, Tomio, to Sanko Kiki Kabushiki Kaisha. Spare wheel holding device. 3,856,167, Cl. 214-451.000.

Yasui, Hiroshi: *See*—
Ogawa, Tadaharu; Yasui, Hiroshi; and Kaji, Shigeo, 3,856,505.

Yatsushiro, Kenji; and Kuchuris, George F., to Controls company of America. Synchronous motor stator pole arrangement. 3,857,053, Cl. 310-162.000.

Yeagle, Richard J., to Skuttle Manufacturing Company. Humidifier assembly. 3,856,279, Cl. 261-80.000.

Yerkes, Richard H. Throw mats. 3,855,731, Cl. 49-70.000.

Yetter, Edward W.: *See*—
English, Myrle H.; Goodstal, Laurence; Leek, Wayne E.; Sanzo, Robert J.; Turner, Robert L.; Workman, Clark B.; and Yetter, Edward W., 3,857,025.

Yielding, Douglas L.: *See*—
Neumann, James W.; and Yielding, Douglas L., 3,856,901.

Yokoi, Hiromu; Ito, Kenichi; and Mizobuchi, Kenji, to Tokyo Shibaura Electric Co., Ltd. and Tokyo Electronic Industry Co., Ltd. Ultrasonic diagnostic apparatus. 3,856,985, Cl. 178-6.000.

Yokotani, Hajime; Miyamoto, Masuo; and Murata, Tadakazu, to Takeda Chemical Industries, Ltd. Cholagogic composition containing pentanedione derivatives. 3,856,911, Cl. 424-331.000.

Yokoyama, Yujiro: *See*—
Iijima, Akira; Yokoyama, Yujiro; Yamada, Yosuke; and Kimura, Makoto, 3,856,448.

Yoshida Kogyo Kabushiki Kaisha: *See*—
Fujisaki, Yoshinori, 3,855,671.
Takamatsu, Ikuo, 3,855,672.

Yoshida, Takeo: *See*—
Mizunuma, Tsutomu; and Yoshida, Takeo, 3,856,540.

Yoshino, Teruo: *See*—
Ishido, Yoshiharu; Yoshino, Teruo; Komura, Hajime; Suzuki, Katsumi; Yamasaki, Akihiro; and Okutsu, Masaru, 3,856,777.

Yoshioka, Kouichi: *See*—
Hiraga, Kentaro; Yoshioka, Kouichi; Golo, Giichi; Nakayama, Ryo; and Masuoka, Michio, 3,856,829.

Yoshitomi Pharmaceutical: *See*—
Arimura, Katsuo; Kobayakawa, Toshihiro; Ao, Hideki; and Tsuda, Yoshiaki, 3,856,797.

Yoshizawa, Toshio; Yamada, Yasuo; Taniguchi, Toshinori; Kose, Tatsuo; Ohchi, Kazuo; and Hori, Kiyokazu, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho and Daiwa Boseki Kabushiki Kaisha. Device for biasing yarn into fixed position for use with yarn cuttin mechanism of automatic doffing apparatus. 3,855,771, Cl. 57-53.000.

Young, James Leroy, to GAF Corporation. Knife module for cutting roll stock in automated equipment. 3,855,891, Cl. 83-582.000.

Young, Lester Charles, to Combustion Engineering, Inc. Apparatus for lifting flasks and molds. 3,855,796, Cl. 60-547.000.

Younger, Reat R., to United States T.R.A.D. Corporation. Outdoor drive-in theater. 3,856,388, Cl. 352-40.000.

Yuguchi, Hiroya: *See*—
Nagasawa, Taro; Hamada, Kozo; Yuguchi, Hiroya; and Mizuguchi, Kenji, 3,856,627.

Yumoto, Hirokazu. Stereographic picture book. 3,855,726, Cl. 46-34.000.

Zahnradfabrik Friedrichshafen AG: *See*—
Jablonsky, Erich, 3,855,904.

Zaidan Hojin Biseibutsu Kagaku Kenkyukai (Microbial Chemistry Research Foundation): *See*—
Umezawa, Hamao; Okami, Yoshiro; Takeuchi, Tomio; and Ishiyama, Tetsuji, 3,856,969.

Zanboorie, Mohammed H., to United States of America, Health, Education, and Welfare. Switch failure monitoring device. 3,857,067, Cl. 317-9.00a.

Zankl, Frank, to Kearney & Trecker Corporation. Automatic lubrication system. 3,856,114, Cl. 184-6.100.

Zanoni, Carl A., to Zygo Corporation. Optical noncontacting diameter gauge. 3,856,411, Cl. 356-167.000.

Zanoni, Carl A., to Zygo Corporation. Optical noncontacting gauge. 3,856,412, Cl. 356-167.000.

Zaslowsky, Joel A.: *See*—
Daniher, Francis A.; and Zaslowsky, Joel A., 3,856,791.

Zeeh, Bernd; Jung, Johann; and Rentzea, Costin, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Agent for controlling the growth of plants. 3,856,501, Cl. 71-76.000.

Zeltcer, Sandra M.: *See*—
Glickman, Sophie, 3,855,646.

Zenith Radio Corporation: *See*—
Baur, Leslie L.; and Hajduk, Thaddeus J., 3,856,129.

Zentz, William E., Jr., to Engelhard Minerals & Chemicals Corporation. Opacity of clay films. 3,856,563, Cl. 117-152.000.

Zibin, Dzintar Karlovich. Pulse counter. 3,857,102, Cl. 328-41.000.

Ziffermayer, Georg: *See*—
Schweitzer, Samuel; and Ziffermayer, Georg, 3,856,472.

Zimmer, Edward J. Wire dispensing cart. 3,856,230, Cl. 242-86.50r.

Zimmermann, Heino; and Hansemann, Heinrich, to Gerdts, Gustav F., KG. Method for measuring liquid level by electrical conductivity. 3,855,861, Cl. 73-304.00r.

Zinnes, Harold; Sircar, Jagadish C.; and Shavel, John, Jr., to Warner-Lambert Company. Alkylaminoalkyl 4-hydroxy-2-methyl-2H-1,2-benzothiazine-3-carboxylate 1,1-dioxides and N-alkyl-aminoalkyl-4-hydroxy-2-methyl-2H-1,2-benzothiazine-3-carboxamide 1,1-diode. 3,856,784, Cl. 260-243.00r.

Zitelli, William E.: *See*—
Carlson, Norman R.; and Zitelli, William E., 3,857,027.

Zoecon Corporation: *See*—
Henrick, Clive A.; and Siddall, John B., 3,856,866.

Zoltan, Steven I., to Gould Inc. Pulsed droplet ejecting system. 3,857,049, Cl. 310-8.100.

Zwettler, Ernst; and Goebels, Siegmund E. Automatic film processing machine. 3,857,040, Cl. 250-481.000.

Zygo Corporation: *See*—
Zanoni, Carl A., 3,856,411.
Zanoni, Carl A., 3,856,412.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 24TH DAY OF DECEMBER, 1974

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aleks, Vytant P., to Keystone Consolidated Industries, Inc. Handle latch and label holder. Re. 28,280, 12–24–74, Cl. 312—320.

Amsted Industries Inc.: *See*—
Robertson, Hugh G. Re. 28,279.

Benjamin, Sidney H., and O. A. Krauer, to Otis Elevator Co. Speed dictation apparatus for elevator motor control system. Re. 28,282, 12–24–74, Cl. 187—29.

Bridgeford, Douglas J., to Tee-Pak, Inc. Method of coating the interior of a sausage casing. Re. 28,281, 12–24–74, Cl. 117—96.

Cowpland, Michael C., and R. C. Foss, to Microsystems International Ltd. Threshold circuit for tone-ringer or like load means. Re. 28,283, 12–24–74, Cl. 179—84.

Foss, Richard C.: *See*—
Cowpland, Michael C., and Foss. Re. 28,283.

Keystone Consolidated Industries, Inc.: *See*—
Aleks, Vytant P. Re. 28,280.

Krauer, Otto A.: *See*—
Benjamin, Sidney H., and Krauer. Re. 28,282.

Microsystems International Ltd.: *See*—
Cowpland, Michael C., and Foss. Re. 28,283.

Otis Elevator Co.: *See*—
Benjamin, Sidney H., and Krauer. Re. 28,282.

Robertson, Hugh G., to Amsted Industries, Inc. Center plate wear liner ring. Re. 28,279, 12–24–74, Cl. 105—199.

Tee-Pak, Inc.: *See*—
Bridgeford, Douglas J. Re. 28,281.

LIST OF PLANT PATENTEES

Armstrong Nurseries, Inc.: *See*—
Ellis, Arnold W., and Swim. 3,670.

Duffett, William E.: *See*—
Jessel, Walter H., Jr., and Duffett. 3,671.
Jessel, Walter H., Jr., and Duffett. 3,672.
Jessel, Walter H., Jr., and Duffett. 3,673.

Ellis, Arnold W., and H. C. Swim, to Armstrong Nurseries, Inc. Rose plant. 3,670, 12–24–74, Cl. 11.

Jessel, Walter H., Jr., and W. E. Duffett, to Yoder Brothers, Inc. Chrysanthemum plant. 3,671, 12–24–74, Cl. 74.

Jessel, Walter H., Jr., and W. E. Duffett, to Yoder Brothers, Inc. Chrysanthemum plant. 3,672, 12–24–74, Cl. 74.

Jessel, Walter H., Jr., and W. E. Duffett, to Yoder Brothers, Inc. Chrysanthemum plant. 3,673, 12–24–74, Cl. 78.

Swim, Herbert C.: *See*—
Ellis, Arnold W., and Swim. 3,670.

Yoder Brothers, Inc.: *See*—
Jessel, Walter H., Jr., and Duffett. 3,671.
Jessel, Walter H., Jr., and Duffett. 3,672.
Jessel, Walter H., Jr., and Duffett. 3,673.

LIST OF DESIGN PATENTEES

AB Gustarsbergs Fabriken: *See*—
Juhlin, Sven-Eric. 233,972.

A.G.E. Bodegas Unidas S.A.: *See*—
Laterre, Emiliano P. 233,979.

Ajax Hardward Corp.: *See*—
Ridgway, Keith E., Dahl, and Gorton. 233,976.

Baker, Kenneth R., and R. E. Plescia, to Marine Propulsion Systems, Inc. Hydrojet boat drive. 233,983, 12–24–74, Cl. D12—70.

Bako, Lazlo, to Presto Lock Co., division of Walter Kidde & Co. Inc. Combined buckle and combination lock. 233,959, 12–24–74, Cl. D2—42.

Beatrice Foods Co.: *See*—
Katz, Robert E. 234,003.
Katz, Robert E. 234,004.

Bentley, Karen M. Dress. 233,960, 12–24–74, Cl. D2—72.

Best, Don A. Fishing lure. 233,988, 12–24–74, Cl. D22—27.

Bishop, James K., Sr. Multicompartment birdhouse. 233,994, 12–24–74, Cl. D30—3.

Bogner, Max: *See*—
Grun, Larry, and Bogner. 234,000.

Booth, Dwight A., to MDT Instrument Co. Control center support arm for dental chair. 233,990, 12–24–74, Cl. D24—1.

Camp, Virgil C. Fountain. 233,989, 12–24–74, Cl. D23—13.

Corbett, Thomas A.: *See*—
Marr, Donald P., and Corbett. 233,992.

Corderman, Allan B., and P. B. Flagler. Motion picture/slide projector console. 234,009, 12–24–74, Cl. D61—1.

Corderman, Allan B., and P. B. Flagler. Motion picture/slide projector console. 234,010, 12–24–74, Cl. D61—1.

Corning Glass Works: *See*—
Kiernan, Alice, Luzier, and Mirow. 233,974.

Crawford, Lois H. Denture brush. 233,961, 12–24–74, Cl. D4—24.

Dahl, Roger: *See*—
Ridgway, Keith E., Dahl, and Gorton. 233,976.

De Graw, William E., to E. Gallo and J. Kinney. Bottle. 233,982, 12–24–74, Cl. D9—148.

Dyal, Gilbert A. Portable cord and rope storage rack. 233,977, 12–24–74, Cl. D8—220.

Esquire, Inc.: *See*—
Gore, Fred M., and McReynolds. 234,002.

Flagler, Philip B.: *See*—
Corderman, Allan B., and Flagler. 234,009.
Corderman, Allan B., and Flagler. 234,010.

France Bed Co., Ltd.: *See*—
Katoda, Kenichi. 233,969.

Gallo, E.: *See*—
De Graw, William E. 233,982.

Gore, Fred M., and G. H. McReynolds, to Esquire, Inc. Floodlight. 234,002, 12–24–74, Cl. D48—20.

Gorton, Howard R.: *See*—
Ridgway, Keith E., Dahl, and Gorton. 233,976.

Grun, Larry, and M. Bogner. Finger ring. 234,000, 12–24–74, Cl. D45—10.

Hannah, Bruce R.: *See*—
Morrison, Andrew L., and Hannah. 233,962.
Morrison, Andrew L., and Hannah. 233,964.
Morrison, Andrew L., and Hannah. 233,965.
Morrison, Andrew L., and Hannah. 233,966.
Morrison, Andrew L., and Hannah. 233,967.
Morrison, Andrew L., and Hannah. 233,968.

Hauser, William C., to Lockhart Industries, Inc. Oil cooler for motorcycles. 233,984, 12–24–74, Cl. D12—114.

Hicks, Marvin L. Combined cross and peace symbol. 233,993, 12–24–74, Cl. D29—23.

Hockenberry, Jack: *See*—
Hodges, Ronald R., and Hockenberry. 233,971.

Hodges, Ronald R., to Steelcase Inc. Storage unit. 233,970, 12–24–74, Cl. D6—166.

Hodges, Ronald R., and J. Hockenberry, to Steelcase Inc. Table. 233,971, 12–24–74, Cl. D6—177.

Jensen, Paul V. Dispenser for granular materials. 233,973, 12–24–74, Cl. D7—17.

Jones, Jimmie L., to Ute Indian Tribe of the Unitah and Ouray Reservation. Motel room building. 233,985, 12–24–74, Cl. D13—1.

Jones, Jimmie L., to Ute Indian Tribe of the Unitah and Ouray Reservation. Public building. 233,986, 12–24–74, Cl. D13—1.

Jones, Jimmie L., to Ute Indian Tribe of the Unitah and Ouray Reservation. Restaurant building. 233,987, 12–24–74, Cl. D13—1.

Juhlin, Sven-Eric, to AB Gustarsbergs Fabriken. Child's drinking mug and lid therefor. 233,972, 12–24–74, Cl. D7—10.

Kabushiki Kaisha Ricoh: *See*—
Yagi, Ohijo, and Shiina. 234,005.

Katoda, Kenichi, to France Bed Co., Ltd. Chair. 233,969, 12–24–74, Cl. D6—76.

Katz, Robert E., to Beatrice Foods Co. Combined envelope and sheet for advertisement. 234,003, 12–24–74, Cl. D59—8.

Katz, Robert E., to Beatrice Foods Co. Combined envelope and sheet for advertisement. 234,004, 12–24–74, Cl. D59—8.

Kiernan, Alice, P. A. Luzier, and G. Mirow, to Corning Glass Works. Coffeemaker. 233,974, 12–24–74, Cl. D7—65.

Kinney, J.: *See*—
De Graw, William E. 233,982.

Knoll International, Inc.: *See*—
Morrison, Andrew L., and Hannah. 233,962.
Morrison, Andrew L., and Hannah. 233,964.
Morrison, Andrew L., and Hannah. 233,965.
Morrison, Andrew L., and Hannah. 233,966.
Morrison, Andrew L., and Hannah. 233,967.
Morrison, Andrew L., and Hannah. 233,968.

Laterre, Emiliano P., to A.G.E. Bodegas Unidas S.A. Bottle. 233,979, 12–24–74, Cl. D9—54.

Lee, Kenneth P. Linoleum layer's corner scriber. 233,975, 12–24–74, Cl. D8—16.

Lockhart Industries, Inc.: *See*—
Hauser, William C. 233,984.
Luzier, Patricia A.: *See*—
Kiernan, Alice, Luzier, and Mirow. 233,974.
MDT Instrument Co.: *See*—
Booth, Dwight A. 233,990.
Marine Propulsion Systems, Inc.: *See*—
Baker, Kenneth R., and Plescia. 233,983.
Marr, Donald P., and T. A. Corbett, to Marr Electric Ltd. Electrical wire connector. 233,992, 12–24–74, Cl. D26—1.
Marr Electric Ltd.: *See*—
Marr, Donald P., and Corbett. 233,992.
McReynolds, Glen H.: *See*—
Gore, Fred M., and McReynolds. 234,002.
Miller, Bruce B. Medical tubing restraint holder or similar article. 233,995, 12–24–74, Cl. D32—1.
Mirow, Gregory: *See*—
Kiernan, Alice, Luzier, and Mirow. 233,974.
Morrison, Andrew L., and B. R. Hannah, to Knoll International, Inc. Bench or similar article. 233,962, 12–24–74, Cl. D6—35.
Morrison, Andrew L., and B. R. Hannah, to Knoll International, Inc., Armchair or similar article. 233,964, 12–24–74, Cl. D6—66.
Morrison, Andrew L., and B. R. Hannah, to Knoll International, Inc. Chair or similar article. 233,965, 12–24–74, Cl. D6—66.
Morrison, Andrew L., and B. R. Hannah, to Knoll International, Inc. Chair or similar article. 233,966, 12–24–74, Cl. D6—66.
Morrison, Andrew L., and B. R. Hannah, to Knoll International, Inc. Chair or similar article. 233,967, 12–24–74, Cl. D6—66.
Morrison, Andrew L., and B. R. Hannah, to Knoll International, Inc. Airchair or similar article. 233,968, 12–24–74, Cl. D6—66.
Murrey, Gordon W. Combination integral pocket liner and gulley boot for a billiard table or the like. 233,996, 12–24–74, Cl. D34—3.
Olson, George E.: *See*—
Strowe, Robert J., and Olson. 234,001.
Palmer, Donald M. Tag holder. 233,978, 12–24–74, Cl. D8—243.
Plescia, Ronald E.: *See*—
Baker, Kenneth R., and Plescia. 233,983.
Potter, John W. Aerial toy. 233,999, 12–24–74, Cl. D34—15.
Presto Lock Co., division of Walter Kidde & Co. Inc.: *See*—
Bako, Lazlo. 233,959.
Ridgway, Keith E., R. Dahl, and H. B. Gorton, to Ajax Hardward Corp. Bathroom door lock. 233,976, 12–24–74, Cl. D8—133.
Ritter, Jack V. Image splitter. 234,007, 12–24–74, Cl. D61—1.
Ritter, Jack V. Image splitter. 234,008, 12–24–74, Cl. D61—1.
Schalitz, Charles E. Turret bowling pin holder. 233,997, 12–24–74, Cl. D34—5.
Schalitz, Charles E. Turret bowling pin holder. 233,998, 12–24–74, Cl. D34—5.
Shiina, Toshio: *See*—
Yagi, Ohilo, and Shiina. 234,005.
Smith, Henry O. J., and E. A. Summerfield. Electrical connector. 233,991, 12–24–74, Cl. D26—1.
Societe d'Assistance Technique pour produits Nestle S.A.: *See*—
Watt, Donald G. 233,980.
Watt, Donald G. 233,981.
Steelcase Inc.: *See*—
Hodges, Ronald R. 233,970.
Hodges, Ronald R., and Hockenberry. 233,971.
Stegman, Robert A. Combined optical and nasal air filter mask. 234,012, 12–24–74, Cl. D83—1.
Streamlight, Inc.: *See*—
Strowe, Robert J., and Olson. 234,001.
Strowe, Robert J., and G. E. Olson, to Streamlight, Inc. Searchlight. 234,001, 12–24–74, Cl. D48—24.
Summerfield, Edward A.: *See*—
Smith, Henry O. J., and Summerfield. 233,991.
Ute Indian Tribe of the Unitah and Ouray Reservation: *See*—
Jones, Jimmie L. 233,985.
Jones, Jimmie L. 233,986.
Jones, Jimmie L. 233,987.
Wang, Daniel, and C. Wong. Stereo photo viewer. 234,006, 12–24–74, Cl. D61—1.
Warneford, Walter J. Engine manifold. 234,011, 12–24–74, Cl. D77—1.
Watt, Donald G., to Societe d'Assistance Technique pour produits Nestle S.A. Bottle. 233,980, 12–24–74, Cl. D9—115.
Watt, Donald G., to Societe d'Assistance Technique pour produits Nestle S.A. Combined bottle and cap therefor. 233,981, 12–24–74, Cl. D9—117.
Welton, Gerry D. T-sling chair. 233,963, 12–24–74, Cl. D6—55.
Wong, Cynthia: *See*—
Wang, Daniel, and Wong. 234,006.
Yagi, Ohilo, and T. Shiina, to Kabushiki Kaisha Ricoh. Automatic copy sheet feeder for copiers. 234,005, 12–24–74, Cl. D61—1.

CLASSIFICATION OF PATENTS

ISSUED DECEMBER 24, 1974

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2
2 3,855,631
2.5 3,855,632
18 3,855,633
114 3,855,635
153 3,855,636
172 3,855,634
301 3,855,637

CLASS 3
1 3,855,638

CLASS 4
7 3,855,639
3,855,640
10 3,855,641
131 3,855,645
149 3,855,642
172.12 3,855,643
185B 3,855,644
185S 3,855,646
187A 3,855,647
199 3,855,648
252R 3,855,649

CLASS 5
21 3,855,650
248 3,855,651
317R 3,855,655
327R 3,855,652
331 3,855,654
351 3,855,653

CLASS 8
127.5 3,856,464

CLASS 9
8R 3,855,656

CLASS 12
142RS 3,855,657

CLASS 15
77 3,855,658
181 3,855,659
3,855,660
250.01 3,855,661
3,855,662
250.04 3,855,663
250.42 3,855,664
339 3,855,665
372 3,855,666

CLASS 16
168 3,855,667

CLASS 17
71 3,855,668

CLASS 23
230EP 3,856,468
230B 3,856,469
230L 3,856,465
230R 3,856,466
3,856,467
252 3,856,472
253R 3,856,470
3,856,471
254E 3,856,473
258.5 3,856,475
267R 3,856,474
284 3,856,476
294 3,856,477

CLASS 24
16PB 3,855,669
3,855,670
205.1C 3,855,671
3,855,672
3,855,673
230A 3,855,674

CLASS 28
71.3 3,855,676
72R 3,855,677
74R 3,855,678

CLASS 29
105A 3,855,680
115 3,855,681
157.3R 3,855,682
159.01 3,855,683
182 3,856,478
183 3,856,479
195 3,856,480
197 3,855,679
200D 3,855,684
203L 3,855,685
208E 3,855,686
211C 3,855,687
432 3,855,688
433 3,855,689
571 3,855,690
605 3,855,694
608 3,855,691
625 3,855,692
626 3,855,693

CLASS 30
30 3,855,695
3,855,696
34.1 3,855,697
124 3,855,698
135 3,855,699
162 3,855,700

CLASS 32
14A 3,855,701
15 3,855,702
17 3,855,703
28 3,855,704
40R 3,855,705

CLASS 33
1SD 3,855,706
24C 3,855,707
169R 3,855,708
203.15 3,855,709
295 3,855,710
327 3,855,711

CLASS 34
5 3,855,712
9 3,855,719
122 3,855,713

CLASS 35
17 3,855,714

CLASS 36
2.5AL 3,855,716
50 3,855,715

CLASS 38
60 3,855,717
102.2 3,855,718

CLASS 43
25 3,855,720
42.32 3,855,721
42.34 3,855,722
44.83 3,855,723
65 3,855,727
92 3,855,724

CLASS 44
10H 3,856,481

CLASS 46
1C 3,855,725
34 3,855,726
74D 3,855,728
116 3,855,729
158 3,855,730

CLASS 49
70 3,855,731
425 3,855,732
488 3,855,733

CLASS 51
164 3,855,740
165R 3,855,734
3,855,735
165.75 3,855,736
216R 3,855,737
217R 3,855,738
234 3,855,739

CLASS 52
19 3,855,741
65 3,855,755
79 3,855,743
98 3,855,742
126 3,855,744
159 3,855,745
213 3,855,746
363 3,855,750
404 3,855,747
520 3,855,753
585 3,855,748
603 3,855,751
605 3,855,752
755 3,855,754

CLASS 53
26 3,855,756
188 3,855,757
226 3,855,758
306 3,855,749
342 3,855,759

CLASS 55
36 3,856,482
38 3,856,483
48 3,856,484
73 3,856,485
210 3,856,486
223 3,856,487
300 3,856,488
379 3,856,489
420 3,856,490
478 3,856,491

CLASS 56
13.2 3,855,760
27.5 3,855,762
51 3,855,761
320.2 3,855,763
327A 3,855,764
340 3,855,765
400.18 3,855,766

CLASS 57
18 3,855,767
24 3,855,768
34R 3,855,769
34.5 3,855,770
53 3,855,771
58.83 3,855,773
58.95 3,855,772
81 3,855,774
140BY 3,855,775
153 3,855,776
156 3,855,777
3,855,778

CLASS 58
4A 3,855,780
3,855,781
23R 3,855,782
50R 3,855,783
3,855,784
58 3,855,785
82A 3,855,779
88C 3,855,786
126D 3,855,787

CLASS 60
39.03 3,855,788
225 3,855,789
361 3,855,790
380 3,855,791
421 3,855,792
431 3,855,793
524 3,855,795
546 3,855,794
547 3,855,796
3,855,797
585 3,855,798

CLASS 61
11 3,855,799
29 3,855,800
45D 3,855,802
3,855,805
3,855,808
45R 3,855,801
46.5 3,855,803
3,855,809
53.6 3,855,804
69 3,855,806
72.1 3,855,807

CLASS 62
9 3,855,810
45 3,855,811
58 3,856,492
135 3,855,812
196 3,855,813
217 3,855,836
244 3,855,814
266 3,855,815
387 3,855,816
401 3,856,493

CLASS 64
2R 3,855,817
28R 3,855,818

CLASS 65
2 3,856,494
19 3,856,495
29 3,856,496
33 3,856,497
60 3,856,498
104 3,856,499

CLASS 66
50R 3,855,819
87 3,855,820
132 3,855,821
147 3,855,822

CLASS 69
32 3,855,823

CLASS 70
14 3,855,825
38A 3,855,824
3,855,826
134 3,855,827
243 3,855,828
362 3,855,829

CLASS 71
34 3,856,500
76 3,856,501
77 3,856,502
90 3,856,503
121 3,856,504

CLASS 72
8 3,855,830
32 3,855,831
84 3,855,832
91 3,855,833
179 3,855,834
183 3,855,835
334 3,855,862
354 3,855,837
389 3,855,838
417 3,855,839
418 3,855,840

CLASS 73
11 3,855,841
13 3,855,842
30 3,855,845
37 3,855,843
40.7 3,855,844
61.1C 3,855,846
71.4 3,855,847
81 3,855,848
86 3,855,849
88B 3,855,850
115 3,855,851
135 3,855,852
151 3,855,853
3,855,854
3,855,855
3,855,856
3,855,857
194EM 3,855,858
194B 3,855,859
243 3,855,860
304R 3,855,861
339C 3,855,863
355R 3,855,864
368.2 3,855,865
372 3,855,866
425.6 3,855,867
3,855,868

CLASS 74
22R 3,855,869
234 3,855,870
242.1FP 3,855,871
242.16 3,855,872
436 3,855,873
462 3,855,874
481 3,855,875
492 3,855,876
531 3,855,877
665Q 3,855,878
687 3,855,879
868 3,855,880

CLASS 75
.5A 3,856,507
3 3,856,505
3,856,506
29 3,856,508
42 3,856,509
60 3,856,510
68B 3,856,511
101R 3,856,512
122 3,856,513
124 3,856,514
126C 3,856,515
128A 3,856,517
128W 3,856,516

CLASS 81
15.7 3,855,881
121R 3,855,882
125 3,855,883
177UJ 3,855,884

CLASS 82
34B 3,855,885

CLASS 83
7 3,855,886
49 3,855,887
303 3,855,888
331 3,855,890
490 3,855,889
582 3,855,891
835 3,855,892

CLASS 84
1.24 3,855,893
423 3,855,894

CLASS 85
1L 3,855,895
78 3,855,896

CLASS 87
1 3,855,897

CLASS 89
36H 3,855,898
47 3,855,899
159 3,855,900

CLASS 90
78 3,855,901

CLASS 91
359 3,855,904
384 3,855,905
420 3,855,902
480 3,855,903

CLASS 92
153 3,855,906

CLASS 93
35SB 3,855,907
36.5R 3,855,908

CLASS 96
1R 3,856,518
1.4 3,856,519
3 3,856,520
3,856,521
3,856,522
33 3,856,523
35 3,856,524
36.1 3,856,525
48HD 3,856,526
3,856,527
49 3,856,528
81 3,856,529
87A 3,856,530
91N 3,856,531
124 3,856,532

CLASS 98
40D 3,855,909
42 3,855,910

CLASS 99
275 3,855,914
450.4 3,855,912
487 3,855,913
495 3,855,915
511 3,855,911
623 3,855,916

CLASS 100
35 3,855,917
49 3,855,918
52 3,855,919
53 3,855,920
3,855,921

CLASS 101
3R 3,855,922
93.29 3,855,923
129 3,855,924
333 3,855,925
336 3,855,926
350 3,855,927
471 3,855,928

CLASS 102
24HC 3,855,929
34.4 3,855,930
38 3,855,931
49.5 3,855,932
56 3,855,933
70R 3,855,934

CLASS 104
48 3,855,935
63 3,855,936
94 3,855,937
130 3,855,938
148MS 3,855,939

CLASS 105
77 3,855,940
150 3,855,941
197DB 3,855,942
199C Re.28,279

CLASS 106
10 3,856,533
13 3,856,534
15FP 3,856,535
22 3,856,536
55 3,856,537
68 3,856,538
75 3,856,539
89 3,856,540
90 3,856,541
102 3,856,542
110 3,856,543
120 3,856,544
288B 3,856,545
300 3,856,546
316 3,856,547

CLASS 108
28 3,855,943
55 3,855,944
57 3,855,945
144 3,855,946
161 3,855,947
3,855,948

CLASS 109
23 3,855,949

CLASS 110
8C 3,855,950
8R 3,855,951
173A 3,855,952

CLASS 111
1 3,855,953

CLASS 112
152 3,855,955
158E 3,855,956

CLASS 115
28R 3,855,957

CLASS 116
116 3,855,958
124R 3,855,959
3,855,960
3,855,961
124.1 3,855,962
3,855,963
124.4 3,855,964

CLASS 117
6 3,856,548
33.3 3,856,549
33.5R 3,856,550
36.2 3,856,551
3,856,552
3,856,553
36.8 3,856,554
37LE 3,856,555
62 3,856,556
70B 3,856,568
71R 3,856,557
96 Re.28,281
106R 3,856,558
119.6 3,856,559
132B 3,856,560
139 3,856,561
140A 3,856,562
152 3,856,563
155UA 3,856,564
212 3,856,565
218 3,856,566
221 3,856,567

CLASS 118
16 3,855,965
66 3,855,966
230 3,855,967
308 3,855,968
637 3,855,969

CLASS 119
5 3,855,970
52AF 3,855,971

CLASS 123
3 3,855,980
8.09 3,855,972
32EA 3,855,973
3,855,974
41.13 3,855,975
41.62 3,855,976
43C 3,855,977
44C 3,855,978
47A 3,855,979
90.27 3,855,981
139AM 3,855,982
146.5A 3,855,983
148E 3,855,984
3,855,985
191A 3,855,986
196R 3,855,987

CLASS 124
11R 3,855,988
13A 3,855,989
3,855,990
24R 3,855,991

CLASS 125
11CD 3,855,992

CLASS 126
91A 3,855,993
198 3,855,994

CLASS 127
34 3,856,569

CLASS 128
1D 3,855,995
1R 3,855,996
2F 3,855,997
2.05G 3,855,999
2.1B 3,855,998
6 3,856,000
11 3,856,001
67 3,856,002
75 3,856,003
87R 3,856,004
132D 3,856,005
3,856,006
152 3,856,007
165 3,856,008
214.4 3,856,009
3,856,010
283 3,856,011
284 3,856,012
285 3,856,013
290 3,856,014
303.15 3,856,015
325 3,856,016
326 3,856,017
3,856,018
329 3,856,019
347 3,856,020
3,856,021

CLASS 130
6 3,856,022
27Q 3,856,023

CLASS 131
243 3,856,024
264 3,856,025

CLASS 132
73 3,856,026
148 3,856,027

CLASS 134
24 3,856,570
34 3,856,571
96 3,856,572
198 3,856,028

CLASS 135
1R 3,856,029
22 3,856,030
25 3,856,031
28 3,856,032

CLASS 136
86R 3,856,573
120FC 3,856,574
134 3,856,575
139 3,856,576
171 3,856,577

CLASS 137
3 3,856,033
117 3,856,034
216.1 3,856,036
236 3,856,037
344 3,856,038
3,856,039
413 3,856,035
488 3,856,040
493.6 3,856,041
505.42 3,856,042
508 3,856,043
625.11 3,856,045
625.28 3,856,046
625.5 3,856,044
625.61 3,856,047

CLASS 138
31 3,856,048
42 3,856,049
96R 3,856,050
114 3,856,051
119 3,856,052
153 3,856,053
174 3,856,054

CLASS 139
138 3,856,055
291R 3,856,056

CLASS 140
102 3,856,057

CLASS 141
18 3,856,058
165 3,856,059

CLASS 144
34B 3,856,060
312 3,856,061

CLASS 148
1.5 3,856,578
103 3,856,579
105 3,856,580
3,856,581
3,856,582
159 3,856,583
3,856,584
175 3,856,585
186 3,856,586
187 3,856,587
188 3,856,588

CLASS 149
19.8 3,856,590
109.4 3,856,589

CLASS 150
3 3,856,062
35 3,856,063
49 3,856,064

CLASS 151
22 3,856,065
38 3,856,066

CLASS 152
209R 3,856,067
226 3,856,068
233 3,856,069

CLASS 156
3 3,856,591
59 3,856,592
60 3,856,593
63 3,856,594
64 3,856,595
72 3,856,596
3,856,597
85 3,856,598
88 3,856,599
93 3,856,600
96 3,856,601
148 3,856,602
245 3,856,603
329 3,856,606
351 3,856,607
361 3,856,604
436 3,856,605
468 3,856,608

CLASS 157
1.26 3,856,071
13 3,856,070

CLASS 160
84R 3,856,072
201 3,856,073

CLASS 161
16 3,856,609
43 3,856,610
3,856,611
108 3,856,612
116 3,856,613
159 3,856,614
168 3,856,615

CLASS 162
165 3,856,616
276 3,856,617
299 3,856,618
343 3,856,619

CLASS 164
87 3,856,074
323 3,856,075
332 3,856,076

CLASS 165
9 3,856,077
108 3,856,078
184 3,856,079

CLASS 166
120 3,856,080
123 3,856,081
154 3,856,082
224A 3,856,083
257 3,856,084
264 3,856,085
274 3,856,086

CLASS 169
45 3,856,087
46 3,856,088

CLASS 172
4.5 3,856,089
20 3,856,090

CLASS 173
39 3,856,091
122 3,856,092
152 3,856,093

CLASS 174
14 3,856,978
15C 3,856,979
23C 3,856,980
48 3,856,981
151 3,856,983

CLASS 175
4.52 3,856,094
203 3,856,095
325 3,856,096

CLASS 176
19 3,856,620
30 3,856,621
68 3,856,622
78 3,856,623

CLASS 177
1 3,856,097
227 3,856,098

CLASS 178
6 3,856,985
6.5 3,856,986
6.7A 3,856,987
6.8 3,856,988
7.1 3,856,989
7.2 3,856,990
23A 3,856,984

CLASS 179
1GQ 3,856,992
1P 3,856,991
15AT 3,856,993
84T Re.28,283
90R 3,856,982
99 3,856,994
121R 3,856,995
175 3,856,996

CLASS 180
5R 3,856,099
54A 3,856,100
79.2C 3,856,102
79.2R 3,856,101
90 3,856,103
98 3,856,104
3,856,105
116 3,856,106

CLASS 181
33A 3,856,107

CLASS 182
16 3,856,108
84 3,856,109
3,856,110
135 3,856,111
172 3,856,112
194 3,856,113

CLASS 184
6.1 3,856,114

CLASS 186
1R 3,856,115

CLASS 187
28 3,856,116
29R Re.28,282
95 3,856,117

CLASS 188
42 3,856,118
82.3 3,856,119
251A 3,856,120

CLASS 192
3.62 3,856,123
53F 3,856,121
58B 3,856,122
88B 3,856,124
127 3,856,125

CLASS 194
1R 3,856,126

CLASS 195
1.8 3,856,624
31P 3,856,625
49 3,856,626
100 3,856,627
103.5R 3,856,628

CLASS 197
98 3,856,127
133R 3,856,128

CLASS 198
19 3,856,129
24 3,856,130
26 3,856,131
30 3,856,132
182 3,856,133
189 3,856,134
204 3,856,135

CLASS 200
5A 3,856,998
5R 3,856,997
11K 3,856,999
16D 3,857,000
61.64 3,857,001
3,857,002
67DB 3,857,003
84C 3,857,004
144B 3,857,005
148F 3,857,006
153H 3,857,007
153J 3,857,008

CLASS 202
15B 3,856,629
173 3,856,630

CLASS 203
11 3,856,631
3,856,632

CLASS 204
1T 3,856,633
3,856,634
9 3,856,635
29 3,856,637
43G 3,856,638
84 3,856,640
96 3,856,641
149 3,856,642
159.15 3,856,643
3,856,644
159.19 3,856,645
180R 3,856,646
192 3,856,647
3,856,648
195F 3,856,649
195P 3,856,636
243R 3,856,650
255 3,856,651
268 3,856,652
286 3,856,653
298 3,856,654
299 3,856,655
3,856,656

CLASS 206
1.7 3,856,136
73 3,856,137
221 3,856,138
340 3,856,139
388 3,856,140
407 3,856,141
438 3,856,143
462 3,856,144
530 3,856,142

CLASS 208
6 3,856,657
10 3,856,658
80 3,856,659
138 3,856,660
3,856,661
171 3,856,662
209 3,856,663
253 3,856,664

CLASS 209
73 3,856,665
219 3,856,666

CLASS 210
11 3,856,667
21 3,856,668
31C 3,856,669
32 3,856,670
63 3,856,671
3,856,672
3,856,673
71 3,856,674
73 3,856,675
96 3,856,676
3,856,677
3,856,678
169 3,856,679
184 3,856,680
198C 3,856,681
294 3,856,682
336 3,856,683

CLASS 211
40 3,856,145
134 3,856,146
148 3,856,147
3,856,148

CLASS 212
8R 3,855,954
38 3,856,149
46A 3,856,150
55 3,856,151
145 3,856,152

CLASS 213
67A 3,856,153
110 3,856,154
142 3,856,155
151 3,856,156

CLASS 214
1BT 3,856,157
6DK 3,856,158
14 3,856,159
16.1DC 3,856,160
138 3,856,161
152 3,856,162
3,856,163
315 3,856,164
356 3,856,165
370 3,856,166
451 3,856,167
505 3,856,168

CLASS 215
6 3,856,169
224 3,856,170
256 3,856,171
364 3,856,172

CLASS 219
10.55 3,857,009
61 3,857,010
69M 3,857,012
69P 3,857,011
88 3,857,013
121EB 3,857,014
244 3,857,015
368 3,857,016
501 3,857,017

CLASS 220
1T 3,856,173
1.5 3,856,174
22 3,856,175
23.83 3,856,178
82R 3,856,177
200 3,856,176
270 3,856,179

CLASS 222
5 3,856,180
3,856,181
56 3,856,182
70 3,856,183
80 3,856,184
193 3,856,185
402.16 3,856,186
529 3,856,187
535 3,856,188
537 3,856,189

CLASS 223
94 3,856,190

CLASS 224
25A 3,856,191
42.1C 3,856,192
42.1D 3,856,193
3,856,194

CLASS 225
100 3,856,196

CLASS 226
181 3,856,197

CLASS 229
71 3,856,198
93 3,856,199

CLASS 233
1C 3,856,200

CLASS 235
61.11A 3,857,019
61.11E 3,857,020
61.7B 3,857,018
97 3,856,195
150.52 3,857,021
151 3,857,022
151.1 3,857,023
151.11 3,857,025
3,857,026
151.21 3,857,027
151.3 3,857,024

CLASS 236
93 3,856,201

CLASS 238
122 3,856,202

CLASS 239
27 3,856,203
34 3,856,204
63 3,856,205
75 3,856,206
230 3,856,207
251 3,856,208
532 3,856,209
658 3,856,210
685 3,856,211

CLASS 240
10.63 3,857,028
41.3 3,857,029
64 3,856,639
103B 3,857,030

CLASS 241
4 3,856,213
34 3,856,214
39 3,856,215
46R 3,856,216
56 3,856,212
79.1 3,856,217
186R 3,856,218
263 3,856,219
282.1 3,856,220

CLASS 242
1.1R 3,856,221
18A 3,856,222
26.3 3,856,223
55 3,856,224
56R 3,856,226
58.3 3,856,227
71.8 3,856,228
3,856,229
86.5R 3,856,230
118.32 3,856,225
130.2 3,856,231
146 3,856,232
156 3,856,233
189 3,856,234
199 3,856,235

CLASS 244
2 3,856,236
3.11 3,856,237
5 3,856,238
12D 3,856,239
142 3,856,240
154 3,856,241

CLASS 248
20 3,856,242
42 3,856,243
54R 3,856,244
3,856,245
68CB 3,856,246
154 3,856,247
188.2 3,856,248
205A 3,856,249
221 3,856,250
280 3,856,251
402 3,856,252
411 3,856,253

CLASS 249
39 3,856,254
59 3,856,255
66 3,856,256
160 3,856,257
197 3,856,258

CLASS 250
201 3,857,031
231R 3,857,032
303 3,857,033
311 3,857,034
338 3,857,035
367 3,857,036
374 3,857,038
402 3,857,039
481 3,857,040
492 3,857,041
495 3,857,042

CLASS 251
11 3,856,259
129 3,856,260
172 3,856,261
340 3,856,262
347 3,856,263

CLASS 252
8.8 3,856,684
30 3,856,686
33.4 3,856,687
39 3,856,688
51.5A 3,856,689
3,856,690
52R 3,856,691
56R 3,856,685
62.1 3,856,692
62.9 3,856,693
101 3,856,694
162 3,856,695
188 3,856,696
301.4R 3,856,697
301.4S 3,856,698
316 3,856,699
354 3,856,700
358 3,856,701
430 3,856,703
3,856,704
432 3,856,702
3,856,705
450 3,856,706
455R 3,856,707
463 3,856,708
3,856,709
470 3,856,710
545 3,856,711

CLASS 254
88 3,856,264
161 3,856,265
168 3,856,266
183 3,856,267

CLASS 256
13.1 3,856,268

CLASS 259
4 3,856,269
3,856,270

25 3,856,271
95 3,856,272
99 3,856,273
109 3,856,274
161 3,856,275
183 3,856,276
185 3,856,277
192 3,856,278

CLASS 260

2P 3,856,712
3,856,713
2R 3,856,714
2.1R 3,856,715
2.5AQ 3,856,718
2.5BD 3,856,716
2.5HA 3,856,717
3,856,719
2.5A 3,856,720
2.5B 3,856,721
2.5L 3,856,722
4 3,856,723
17.4CL 3,856,724
18EP 3,856,725
23XA 3,856,727
23H 3,856,726
23.7M 3,856,729
23.7N 3,856,728
27R 3,856,730
28.5AS 3,856,732
28.5B 3,856,731
29.6RB 3,856,733
29.6TA 3,856,734
29.6F 3,856,735
3,856,736
29.6M 3,856,737
30.8R 3,856,738
33.2R 3,856,739
33.6AQ 3,856,740
37N 3,856,741
3,856,742
40R 3,856,743
3,856,744
42.14 3,856,745
42.24 3,856,746
45.7P 3,856,747
45.75N 3,856,750
45.9NC 3,856,748
3,856,749
47C 3,856,751
65 3,856,752
75N 3,856,753
3,856,754
77.5AQ 3,856,756
77.5CR 3,856,757
78.4D 3,856,759
78.4N 3,856,758
78.5BB 3,856,760
78.5T 3,856,755
79.5B 3,856,761
3,856,762
80.7 3,856,763
80.73 3,856,765
82.1 3,856,764
88.2 3,856,766
92.8R 3,856,767
94.2M 3,856,768
112.5 3,856,769
3,856,770
112.7 3,856,771
154 3,856,772
205 3,856,773
209R 3,856,774
3,856,775
211.5R 3,856,776
3,856,777
239B 3,856,778
239.1 3,856,779
239.55R 3,856,780
240D 3,856,783
240F 3,856,782
240R 3,856,781
243C 3,856,785
243R 3,856,784
3,856,786
3,856,787
244R 3,856,788
246B 3,856,789
247.2A 3,856,790
247.5R 3,856,792
247.7H 3,856,791
249.8 3,856,793
268PH 3,856,794
283SY 3,856,795
288R 3,856,796
293.66 3,856,797
294.8C 3,856,798
295.5R 3,856,799
296B 3,856,803
3,856,804
296H 3,855,675
3,856,801
296N 3,856,800
296T 3,856,802
299 3,856,805
302R 3,856,806
307F 3,856,807
3,856,923
308C 3,856,808
3,856,809
309.2 3,856,810
3,856,811
326.41 3,856,812
327B 3,856,813
327M 3,856,814
333 3,856,815
338 3,856,816
340.5 3,856,817
3,856,818
343.2R 3,856,819
345.3 3,856,820
3,856,821
3,856,822
3,856,823
346.8A 3,856,824
347.5 3,856,825
348.5V 3,856,826
3,856,827
397.1 3,856,828
397.4 3,856,829
404.5 3,856,830
409 3,856,831
410.9R 3,856,832
413 3,856,833
425 3,856,834
429K 3,856,836
429R 3,856,837
429.5 3,856,839
429.7 3,856,840
429.9 3,856,835
448A 3,856,841
448.2E 3,856,842
448.8R 3,856,843
465D 3,856,846
465.5A 3,856,844
465.9 3,856,845
470 3,856,847
471C 3,856,838
482C 3,856,848
486H 3,856,849
501.13 3,856,850
513.5 3,856,851
514D 3,856,852
518A 3,856,853
519 3,856,854
524R 3,856,855
532 3,856,856
553E 3,856,857
556AR 3,856,858
556A 3,856,859
561HL 3,856,860
563B 3,856,862
566A 3,856,861
570.7 3,856,863
590 3,856,864
615R 3,856,865
632B 3,856,866
665G 3,856,867
666A 3,856,868
668A 3,856,871
3,856,872
3,856,873
3,856,874
668D 3,856,870
668F 3,856,869
3,856,875
671C 3,856,878
676R 3,856,876
677R 3,856,877
680E 3,856,879
3,856,880
3,856,881
681 3,856,882
836 3,856,883
860 3,856,884
862 3,856,885
873 3,856,886
880R 3,856,887
881 3,856,888
897B 3,856,889
3,856,890
897C 3,856,891
899 3,856,894
924 3,856,893
945 3,856,895
948 3,856,892
956 3,856,896
959 3,856,897
990 3,856,898

CLASS 261

18A 3,856,901
80 3,856,279
90 3,856,280

CLASS 264

8 3,856,899
9 3,856,900
41 3,856,914
45.2 3,856,902
51 3,856,903
3,856,904
89 3,856,905
138 3,856,906
254 3,856,907
313 3,856,908

CLASS 266

3R 3,856,281
23NN 3,856,283
23H 3,856,282
34PP 3,856,284

CLASS 267

9C 3,856,285
57 3,856,286
64R 3,856,287
73 3,856,288
154 3,856,289

CLASS 269

14 3,856,290
22 3,856,291
135 3,856,292

CLASS 270

68A 3,856,293

CLASS 271

10 3,856,294
65 3,856,295

CLASS 272

66 3,856,296
79B 3,856,297

CLASS 273

1B 3,856,298
1M 3,856,299
25 3,856,300
55B 3,856,301
55R 3,856,302
85B 3,856,303
85F 3,856,304
95A 3,856,305
98 3,856,306
134A 3,856,307
135R 3,856,308
137R 3,856,309
138A 3,856,310
139 3,856,311
144A 3,856,312
176FB 3,856,313

CLASS 277

1 3,856,314
188 3,856,315

CLASS 280

5A 3,856,316
11.35T 3,856,317
28 3,856,318
43.18 3,856,319
47.35 3,856,320
79.1 3,856,322
87.04 3,856,321
96.2R 3,856,323
106R 3,856,324
124R 3,856,325
150AB 3,856,326
150SB 3,856,327
3,856,328
432 3,856,329
433 3,856,330
479R 3,856,331

CLASS 283

57 3,856,332

CLASS 285

14 3,856,333
137R 3,856,334
286 3,856,335
316 3,856,336
334 3,856,337

CLASS 290

38 3,857,043

CLASS 292

256 3,856,338
336.3 3,856,339

CLASS 294

19R 3,856,340
24 3,856,341
67R 3,856,342
99R 3,856,343

CLASS 296

28M 3,856,344

CLASS 297

16 3,856,345
61 3,856,346
92 3,856,347
195 3,856,348
230 3,856,349
355 3,856,350
388 3,856,351
425 3,856,352
452 3,856,353

CLASS 298

10 3,856,354

CLASS 299

8 3,856,355
11 3,856,356
12 3,856,357
82 3,856,358
92 3,856,359

CLASS 301

65 3,856,360

CLASS 303

6R 3,856,361
7 3,856,362
3,856,363
21BE 3,856,365
21F 3,856,364

CLASS 307

9 3,857,044
208 3,857,045
221R 3,857,046
231 3,857,047
264 3,857,048

CLASS 308

2A 3,856,365
9 3,856,367
187.2 3,856,368

CLASS 310

8.1 3,857,049
13 3,857,050
36 3,857,051
162 3,857,053

CLASS 312

107 3,856,369
118 3,856,370
195 3,856,371
209 3,856,372
216 3,856,373
263 3,856,374
320 Re.28,280

CLASS 313

237 3,857,055
318 3,857,056
371 3,857,037
412 3,857,057
417 3,857,058
486 3,857,054

CLASS 315

99 3,857,060
130 3,857,061
136 3,857,062
170 3,857,063
241P 3,857,064
340 3,857,065
391 3,857,059

CLASS 317

2R 3,857,066
9A 3,857,067
15 3,857,068
18D 3,857,069
18R 3,857,070
44 3,857,071
141R 3,857,072
258 3,857,073
3,857,074

CLASS 318

38 3,857,075
257 3,857,076
3,857,077
608 3,857,078
663 3,857,079
681 3,857,080
687 3,857,081

CLASS 320

25 3,857,082

CLASS 321

14 3,857,083

CLASS 322

28 3,857,084

CLASS 323

22T 3,857,085

CLASS 324

16R 3,857,086
29.5 3,857,087
31 3,857,088
34PS 3,857,089
47 3,857,090
52 3,857,091
61R 3,857,092
65CR 3,857,094
65R 3,857,093
71R 3,857,095
127 3,857,096
132 3,857,097
174 3,857,098

CLASS 325

436 3,857,099

CLASS 328

5 3,857,100
41 3,857,102
72 3,857,101
133 3,857,103
167 3,857,104

CLASS 330

17 3,857,105
53 3,857,106

CLASS 331

1A 3,857,107
14 3,857,108
94.5 3,857,109
108D 3,857,110

CLASS 332

11D 3,857,111

CLASS 333

21A 3,857,112
30R 3,857,113
73S 3,857,114
84M 3,857,115

CLASS 339

31R 3,856,375
107 3,856,376

CLASS 340

149R 3,857,052

CLASS 350

6 3,856,377
96WG 3,856,378
3,856,379
157 3,856,380
160LC 3,856,381
214 3,856,385
3,856,386
285 3,856,382
302 3,856,383
310 3,856,384

CLASS 352

5 3,856,387
40 3,856,388
129 3,856,389
130 3,856,390

CLASS 353

88 3,856,391
101 3,856,392

CLASS 354

258 3,856,393
275 3,856,394
299 3,856,395

CLASS 355

10 3,856,396
45 3,856,397
63 3,856,398

CLASS 356

1 3,856,399
5 3,856,402
28 3,856,400
3,856,401
3,856,403
36 3,856,404
46 3,856,405
106S 3,856,406
114 3,856,408
123 3,856,407
138 3,856,409
167 3,856,410
3,856,411
3,856,412
175 3,856,413
200 3,856,414
205 3,856,415
219 3,856,416
229 3,856,417
233 3,856,418

CLASS 401

5 3,856,419
109 3,856,420

CLASS 403

118 3,856,421
122 3,856,422
140 3,856,423
227 3,856,424

CLASS 404

84 3,856,425
133 3,856,426

CLASS 408

182 3,856,427
240 3,856,428

CLASS 415

53 3,856,429
207 3,856,430
219 3,856,431

CLASS 416

45 3,856,432
97 3,856,433
184 3,856,434

CLASS 417

158 3,856,435
212 3,856,436
241 3,856,437
270 3,856,438
312 3,856,439

CLASS 418

195 3,856,440

CLASS 423

22 3,856,912
27 3,856,913
49 3,856,915
54 3,856,916
3,856,917
69 3,856,918
122 3,856,920
228 3,856,921
268 3,856,922
387 3,856,924
416 3,856,925
448 3,856,926
533 3,856,927
579 3,856,928
613 3,856,929

CLASS 424

1 3,856,930
14 3,856,931
16 3,856,932
42 3,856,933
62 3,856,934
78 3,856,919
92 3,856,935
98 3,856,936
115 3,856,937
116 3,856,938
3,856,939
121 3,856,940
145 3,856,941
180 3,856,942
3,856,943
182 3,856,944
195 3,856,945
3,856,946
202 3,856,947
212 3,856,948
216 3,856,949
226 3,856,950
230 3,856,951
233 3,856,952
238 3,856,953
241 3,856,954
243 3,856,955
3,856,956
246 3,856,957
250 3,856,958
251 3,856,959
3,856,960
258 3,856,909
263 3,856,961
267 3,856,962
3,856,963
273 3,856,964
3,856,965
3,856,966
274 3,856,967
275 3,856,910
276 3,856,968
283 3,856,969
297 3,856,971
298 3,856,972
300 3,856,973
304 3,856,974
3,856,975
317 3,856,976
3,856,977
331 3,856,911

CLASS 425

4C 3,856,442
7 3,856,441
9 3,856,443
60 3,856,444
71 3,856,445
113 3,856,446
114 3,856,447
133.1 3,856,448
308 3,856,449
398 3,856,450
429 3,856,451
3,856,452
447 3,856,453
451 3,856,454

CLASS 431

11 3,856,455
92 3,856,456
353 3,856,457

CLASS 432

5 3,856,458
58 3,856,459
59 3,856,460
60 3,856,461
3,856,462
96 3,856,463

Classification of Designs

D2—	72	233,960			233,968		220	233,977			233,986	D32—	1R	233,995			234,004
	427	233,959		76	233,969		243	233,978			233,987	D34—	3	233,996	D61—	1E	234,007
D4—	24	233,961		166	233,970	D9—	54	233,979	D22—	27	233,988		5DD	233,997			234,008
D6—	35	233,962		177	233,971		115	233,980	D23—	13	233,989			233,998		M	234,006
	55	233,963	D7—	10	233,972		117	233,981	D24—	1B	233,990		15HS	233,999		N	234,009
	66	233,964		17	233,973		148	233,982	D26—	A	233,991	D45—	10A	234,000			234,010
		233,965		65	233,974	D12—	70	233,983		C	233,992	D48—	20K	234,002		Q	234,005
		233,966	D8—	16	233,975		114	233,984	D29—	23A	233,993		24R	234,001	D77—	A	234,011
		233,967		133	233,976	D13—	1B	233,985	D30—	3	233,994	D59—	8	234,003	D83—	K	234,012

Classification of Plants

P. —	11	3,670	P. —	74	3,671	P. —		3,672	P. —	78	3,673			

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama..... 1
Alaska..... 2
American Samoa..... 3
Arizona..... 4
Arkansas..... 5
California..... 6
Canal Zone..... 7
Colorado..... 8
Connecticut..... 9
Delaware..... 10
District of Columbia..... 11
Florida..... 12
Georgia..... 13
Guam..... 14
Hawaii..... 15
Idaho..... 16
Illinois..... 17
Indiana..... 18
Iowa..... 19
Kansas..... 20
Kentucky..... 21
Louisiana..... 22
Maine..... 23
Maryland..... 24
Massachusetts..... 25
Michigan..... 26
Minnesota..... 27
Mississippi..... 28
Missouri..... 29
Montana..... 30
Nebraska..... 31
Nevada..... 32
New Hampshire..... 33
New Jersey..... 34
New Mexico..... 35
New York..... 36
North Carolina..... 37
North Dakota..... 38
Ohio..... 39
Oklahoma..... 40
Oregon..... 41
Pennsylvania..... 42
Puerto Rico..... 43
Rhode Island..... 44
South Carolina..... 45
South Dakota..... 46
Tennessee..... 47
Texas..... 48
Utah..... 49
Vermont..... 50
Virginia..... 51
Virgin Islands..... 52
Washington..... 53
West Virginia..... 54
Wisconsin..... 55
Wyoming..... 56
U.S. Air Force..... 57
U.S. Army..... 58
U.S. Navy..... 59

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 3,855,634
3,856,218
3,856,402
3,856,562
3,857,065
2 : 3,855,710
4 : 3,855,693
3,855,884
3,855,898
3,856,123
3,856,264
5 : 3,855,990
3,856,043
3,856,090
3,856,708
6 : 3,855,641
3,855,643
3,855,649
3,855,661
3,855,674
3,855,692
3,855,701
3,855,716
3,855,720
3,855,729
3,855,736
3,855,744
3,855,753
3,855,755
3,855,756
3,855,789
3,855,807
3,855,824
3,855,825
3,855,849
3,855,850
3,855,852
3,855,854
3,855,855
3,855,856
3,855,860
3,855,867
3,855,873
3,855,877
3,855,889
3,855,893
3,855,909
3,855,916
3,855,926
3,855,930
3,855,931
3,855,932
3,855,934
3,855,947
3,855,949
3,855,957
3,855,970
3,855,984
3,855,991
3,855,995
3,856,003
3,856,007
3,856,011
3,856,019
3,856,028
3,856,042
3,856,057
3,856,099
3,856,112
3,856,127
3,856,146
3,856,158
3,856,176
3,856,188
3,856,204
3,856,207
3,856,219
3,856,235
3,856,245
3,856,248
3,856,274
3,856,283
3,856,300
3,856,331
3,856,339
3,856,344
3,856,346
3,856,352
3,856,355
3,856,380
3,856,381
3,856,382
3,856,392
3,856,398
3,856,403
3,856,468
3,856,469
3,856,471
3,856,491
3,856,550
3,856,576
3,856,585
3,856,589
3,856,590
3,856,593
3,856,603
3,856,631
3,856,670
3,856,687
3,856,702
3,856,705
3,856,717
3,856,793
8 : 3,855,866
3,856,876
3,856,890
3,856,897
3,856,963
3,856,986
3,856,988
3,857,022
3,857,040
3,857,042
3,857,045
3,857,052
3,857,075
3,857,078
3,857,089
3,857,104
3,857,110
3,857,112
8 : 3,855,817
3,855,870
3,856,068
3,856,087
3,856,238
3,856,254
3,856,333
3,856,544
3,856,656
3,856,739
9 : 3,855,635
3,855,681
3,855,714
3,855,791
3,855,887
3,856,130
3,856,159
3,856,267
3,856,268
3,856,411
3,856,493
3,856,523
3,856,609
3,856,653
3,856,722
3,856,862
3,856,902
3,856,918
3,856,941
3,856,951
3,856,987
3,857,069
3,857,081
10 : 3,856,236
3,856,445
3,856,446
3,856,480
3,856,535
3,856,605
3,856,646
3,856,749
3,856,765
3,856,783
3,856,830
3,856,898
3,856,929
11 : 3,856,345
3,856,418
3,856,419
12 : 3,855,658
3,855,706
3,855,721
3,855,723
3,855,765
3,855,917
3,856,171
3,856,216
3,856,265
3,856,332
3,856,977
3,857,020
3,857,066
13 : 3,855,645
3,856,060
3,856,111
3,856,231
3,856,257
3,856,465
3,857,013
3,857,068
16 : 3,855,913
3,855,982
3,856,597
17 : Re.28,280
Re.28,281
3,855,639
3,855,640
3,855,688
3,855,689
3,855,730
3,855,747
3,855,750
3,855,764
3,855,815
3,855,851
3,855,862
3,855,866
3,855,907
3,855,919
3,855,928
3,855,935
3,855,942
3,855,943
3,855,953
3,855,983
3,855,997
3,856,009
3,856,040
3,856,041
3,856,045
3,856,066
3,856,088
3,856,092
3,856,104
3,856,129
3,856,162
3,856,175
3,856,178
3,856,241
3,856,272
3,856,273
3,856,302
3,856,306
3,856,307
3,856,308
3,856,360
3,856,368
3,856,414
3,856,425
3,856,427
3,856,428
3,856,458
3,856,489
3,856,492
3,856,496
3,856,536
3,856,571
3,856,616
3,856,619
3,856,639
3,856,662
3,856,710
3,856,744
3,856,788
3,856,791
3,856,852
3,856,870
3,856,888
3,856,912
3,856,920
3,856,958
3,856,992
3,857,016
3,857,053
18 : 3,855,664
3,855,759
3,855,812
3,855,844
3,855,896
3,855,944
3,855,946
3,855,973
3,856,105
3,856,119
3,856,155
3,856,221
3,856,347
3,856,362
3,856,363
3,856,430
3,856,503
3,856,649
3,856,771
3,856,848
3,856,887
3,856,940
3,857,056
19 : 3,855,761
3,855,793
3,855,799
3,855,971
3,856,021
3,856,102
3,856,163
3,856,210

3,856,420
3,856,634
3,856,683
3,857,093
20 : 3,855,915
3,855,979
3,856,966
3,857,015
3,857,032
21 : 3,855,718
3,856,058
22 : 3,855,835
3,855,929
3,856,354
3,856,511
3,856,583
3,856,630
3,856,700
3,856,844
23 : 3,855,846
3,856,999
24 : 3,855,652
3,855,762
3,855,858
3,855,900
3,856,016
3,856,275
3,856,413
3,856,432
3,856,470
3,856,495
3,856,645
3,856,669
3,856,671
3,856,858
3,856,919
3,856,959
3,857,067
3,857,107
3,857,109
25 : 3,855,646
3,855,650
3,855,657
3,855,700
3,855,734
3,855,883
3,855,923
3,856,027
3,856,144
3,856,157
3,856,198
3,856,214
3,856,242
3,856,251
3,856,259
3,856,277
3,856,294
3,856,312
3,856,342
3,856,387
3,856,389
3,856,390
3,856,434
3,856,473
3,856,520
3,856,521
3,856,522
3,856,555
3,856,558
3,856,567
3,856,628
3,856,633
3,856,654
3,856,679
3,856,922
3,856,942
3,857,009
3,857,017
3,857,019
3,857,021
3,857,033
3,857,079
3,857,082
26 : 3,855,632
3,855,647
3,855,655
3,855,669
3,855,679
3,855,684
3,855,708
3,855,743
3,855,758
3,855,792
3,855,832
3,855,843
3,855,901
3,855,920
3,855,921
3,855,922
3,855,955
3,855,978
3,855,981
3,855,987
3,856,029
3,856,033
3,856,036

3,856,077
3,856,100
3,856,101
3,856,106
3,856,122
3,856,134
3,856,148
3,856,152
3,856,168
3,856,172
3,856,193
3,856,194
3,856,230
3,856,246
3,856,266
3,856,279
3,856,289
3,856,298
3,856,318
3,856,326
3,856,329
3,856,349
3,856,351
3,856,361
3,856,372
3,856,373
3,856,409
3,856,422
3,856,424
3,856,436
3,856,438
3,856,485
3,856,490
3,856,502
3,856,610
3,856,611
3,856,635
3,856,672
3,856,694
3,856,720
3,856,792
3,856,802
3,856,807
3,856,809
3,856,832
3,856,883
3,856,901
3,856,904
3,856,905
3,856,908
3,856,933
3,856,943
3,856,965
3,856,979
3,856,981
3,856,984
3,856,998
3,857,001
3,857,004
3,857,044
3,857,086
3,857,094
27 : 3,855,725
3,855,996
3,856,115
3,856,177
3,856,243
3,856,249
3,856,280
3,856,290
3,856,395
3,856,552
3,856,859
3,857,018
3,857,029
3,857,076
3,857,085
3,857,096
28 : 3,855,924
3,856,004
3,856,140
3,856,233
3,856,435
3,856,504
29 : 3,855,631
3,855,841
3,856,020
3,856,038
3,856,191
3,856,296
3,856,313
3,856,314
3,856,330
3,856,388
3,856,566
3,856,676
3,856,805
3,856,824
3,856,856
30 : 3,855,727
31 : 3,856,316
32 : 3,857,028
33 : 3,855,685
3,855,757
3,856,185
3,856,196

3,856,335
3,856,613
3,856,615
34 : 3,855,648
3,855,659
3,855,695
3,855,696
3,855,749
3,855,783
3,855,895
3,855,912
3,855,933
3,855,956
3,855,966
3,855,967
3,855,972
3,855,980
3,856,005
3,856,006
3,856,015
3,856,049
3,856,074
3,856,075
3,856,117
3,856,136
3,856,253
3,856,310
3,856,366
3,856,405
3,856,431
3,856,449
3,856,466
3,856,487
3,856,513
3,856,528
3,856,545
3,856,546
3,856,547
3,856,554
3,856,561
3,856,563
3,856,565
3,856,578
3,856,591
3,856,595
3,856,607
3,856,626
3,856,638
3,856,657
3,856,658
3,856,659
3,856,663
3,856,664
3,856,675
3,856,690
3,856,704
3,856,711
3,856,734
3,856,747
3,856,763
3,856,780
3,856,781
3,856,782
3,856,784
3,856,787
3,856,796
3,856,801
3,856,803
3,856,808
3,856,813
3,856,817
3,856,818
3,856,822
3,856,835
3,856,841
3,856,860
3,856,861
3,856,864
3,856,867
3,856,869
3,856,871
3,856,872
3,856,873
3,856,874
3,856,875
3,856,895
3,856,921
3,856,960
3,856,975
3,856,989
3,857,047
3,857,072
3,857,091
3,857,099
3,857,106
3,857,113
35 : 3,856,453
36 : Re.28,282
3,855,637
3,855,651
3,855,698
3,855,737
3,855,738
3,855,746
3,855,813
3,855,828

3,855,879
3,855,882
3,855,890
3,855,891
3,855,894
3,855,918
3,855,948
3,855,951
3,855,988
3,855,989
3,856,024
3,856,054
3,856,062
3,856,069
3,856,093
3,856,116
3,856,120
3,856,124
3,856,125
3,856,137
3,856,153
3,856,173
3,856,190
3,856,192
3,856,234
3,856,237
3,856,286
3,856,295
3,856,299
3,856,303
3,856,309
3,856,320
3,856,321
3,856,325
3,856,353
3,856,376
3,856,377
3,856,391
3,856,404
3,856,406
3,856,417
3,856,433
3,856,440
3,856,450
3,856,456
3,856,460
3,856,461
3,856,462
3,856,476
3,856,498
3,856,508
3,856,524
3,856,526
3,856,527
3,856,531
3,856,548
3,856,580
3,856,581
3,856,582
3,856,592
3,856,636
3,856,637
3,856,647
3,856,680
3,856,692
3,856,701
3,856,718
3,856,724
3,856,728
3,856,748
3,856,751
3,856,752
3,856,800
3,856,804
3,856,825
3,856,838
3,856,839
3,856,853
3,856,939
3,856,953
3,856,983
3,856,996
3,856,997
3,857,046
3,857,050
3,857,077
3,857,097
3,857,101
37 : 3,855,642
3,855,760
3,855,822
3,855,834
3,856,139
3,856,229
3,856,612
3,856,753
38 : 3,856,089
3,856,109
39 : Re.28,279
3,855,653
3,855,654
3,855,660
3,855,678
3,855,702
3,855,705
3,855,732

3,855,766
3,855,774
3,855,794
3,855,796
3,855,838
3,855,881
3,855,969
3,855,994
3,856,008
3,856,013
3,856,022
3,856,026
3,856,052
3,856,065
3,856,070
3,856,145
3,856,154
3,856,156
3,856,161
3,856,170
3,856,180
3,856,181
3,856,183
3,856,186
3,856,201
3,856,205
3,856,211
3,856,232
3,856,258
3,856,293
3,856,322
3,856,336
3,856,340
3,856,348
3,856,358
3,856,359
3,856,365
3,856,482
3,856,507
3,856,549
3,856,594
3,856,642
3,856,665
3,856,689
3,856,698
3,856,712
3,856,713
3,856,721
3,856,741
3,856,761
3,856,762
3,856,764
3,856,768
3,856,779
3,856,789
3,856,906
3,856,928
3,857,002
3,857,023
3,857,036
3,857,049
3,857,080
40 : 3,855,656
3,855,745
3,855,754
3,855,965
3,856,079
3,856,084
3,856,085
3,856,319
3,856,541
3,856,560
3,856,629
3,856,660
3,856,732
3,856,735
3,856,736
3,856,750
3,856,774
3,856,868
3,856,879
41 : 3,855,704
3,855,713
3,856,039
3,856,061
3,856,600
3,857,059
42 : 3,855,690
3,855,699
3,855,703
3,855,731
3,855,733
3,855,741
3,855,777
3,855,784
3,855,788
3,855,839
3,855,847
3,855,859
3,855,886
3,855,892
3,855,986
3,856,001
3,856,073
3,856,076
3,856,108

3,856,142
3,856,166
3,856,184
3,856,206
3,856,212
3,856,215
3,856,262
3,856,270
3,856,276
3,856,292
3,856,341
3,856,371
3,856,378
3,856,439
3,856,457
3,856,479
3,856,497
3,856,499
3,856,516
3,856,538
3,856,606
3,856,673
3,856,688
3,856,693
3,856,786
3,856,790
3,856,795
3,856,820
3,856,821
3,856,823
3,856,840
3,856,899
3,856,900
3,856,903
3,856,915
3,856,930
3,856,934
3,856,936
3,856,952
3,856,961
3,856,978
3,856,994
3,857,025
3,857,027
3,857,035
3,857,054
3,857,058
3,857,070
44 : 3,855,636
3,855,769
3,857,000
45 : 3,855,728
3,855,773
3,855,778
3,856,059
3,856,179
3,856,187
3,856,288
3,856,598
3,856,599
3,857,012
46 : 3,856,323
47 : 3,855,722
3,855,960
3,856,044
3,856,250
3,856,622
3,856,624
3,856,706
3,856,851
3,856,889
3,856,891
48 : 3,855,707
3,855,742
3,855,809
3,855,814
3,855,816
3,855,831
3,855,845
3,855,853
3,855,857
3,856,037
3,856,046
3,856,050
3,856,080
3,856,081
3,856,082
3,856,083
3,856,086
3,856,091
3,856,094
3,856,095
3,856,096
3,856,165
3,856,213
3,856,261
3,856,305
3,856,410
3,856,500
3,856,534
3,856,539
3,856,570
3,856,648
3,856,651
3,856,677
3,856,826

	3,856,827	50	3,855,686		3,856,667		3,855,977		3,856,845		3,856,114
	3,856,880	51	3,855,633		3,856,668		3,856,240	54	3,856,714		3,856,151
	3,856,881		3,855,668		3,856,682		3,856,301		3,856,760		3,856,374
	3,856,991		3,855,950		3,856,962		3,856,315		3,856,865		3,856,618
	3,857,087		3,856,203		3,857,031		3,856,517	55	3,855,763		3,856,854
49	3,856,010		3,856,225	53	3,855,748		3,856,537		3,855,875		3,856,896
	3,856,128		3,856,226		3,855,795		3,856,579		3,856,063		3,857,051
	3,856,217		3,856,357		3,855,937		3,856,681		3,856,097	56	3,856,220
	3,856,474		3,856,379								

Design Patents

4	233,977		233,996		233,995		234,003		233,966	45	233,993
6	233,960		233,999		233,997		234,004		233,967	48	234,002
	233,961	12	234,012		233,998		234,009		233,968	49	233,985
	233,975	17	233,963	29	233,973		234,010		234,000		233,986
	233,976	19	233,989		233,994	36	233,962	40	233,988		233,987
	233,982	23	233,974	34	233,959		233,964	41	233,978	53	234,007
	233,983	26	233,970		234,001		233,965		233,990		234,008
	233,984		233,971								

Plant Patents

6	3,670	39	3,671	3,672	3,673		

U. S. GOVERNMENT PRINTING OFFICE : O - 1974

U.S. DEPARTMENT OF COMMERCE
Frederick B. Dent, *Secretary*

PATENT OFFICE
C. Marshall Dann, *Commissioner*